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W. M. JARDINE
Secretary

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FOREWORD

THE Yearbook of Agriculture for 1926, which was characterized distinctively by brief articles on new discoveries in agriculture and kindred fields, received widespread commendation. Such adverse criticism as was directed toward it was based on the conviction that the Yearbook should be prepared primarily for research workers, professors, and students rather than for farmers. ¶ This point of view does not seem to me well founded. To begin with, the Yearbook is distributed far more extensively to farmers than to any other group of persons. Further, it is for the typical farmer one of few books available to him for reading and reference in the field of his occupation. The scientist, the professor, or the student, on the other hand, has library facilities—in some cases access to several hundred thousand times as many books as are available to the farmer. The Department of Agriculture, created for the farmer, has, in my estimation, an obligation to put into his hands a Yearbook informative, interesting, and useful to him. ¶ The Yearbook for 1927, therefore, follows the same method that was employed in the volume for 1926. In addition to the report of the Secretary of Agriculture and the statistics of agriculture, which are regular features of the Yearbook, several hundred articles, arranged alphabetically under the general title, "What's new in agriculture," appear in the volume. None of these articles repeats material that appeared in the preceding Yearbook. Each of them presents up-to-date material on some significant phase of agriculture or rural life. Thus the book carries forward and enlarges the account of agricultural development recorded in the 1926 Yearbook. ¶ Many readers will doubtless want more detailed information about various subjects than is obtainable in the Yearbook, and I hope that they will write to the specialists whose names are signed to the respective articles. Every member of the Department of Agriculture wants the information that it possesses to become of the greatest usefulness possible.

W. M. JARDINE,
Secretary of Agriculture.

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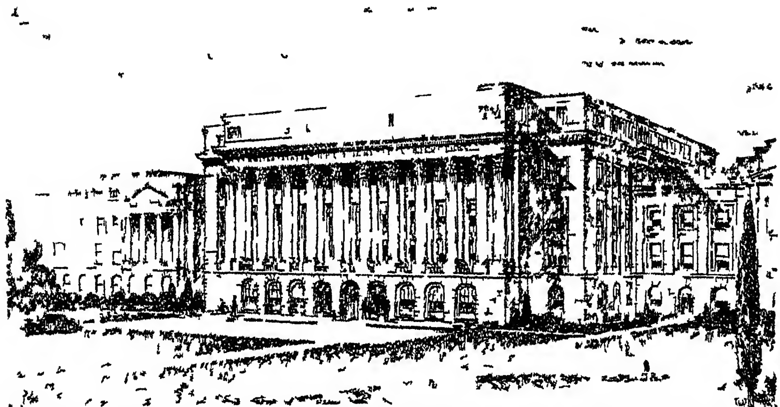


DEPARTMENT'S NEW ADMINISTRATION BUILDING NOW UNDER CONSTRUCTION

WASHINGTON, D. C., *November 3, 1927.*

To the PRESIDENT:

Agriculture in the United States during the last year has made substantial progress in recovery from the effects of the postwar depression. Progress is manifest in better balanced production, in advancing prices for some important crops, notably cotton and cattle, and in further improvement in the relationship between the prices of farm products and the prices of other goods. This relationship is expressed by the Department of Agriculture in index numbers showing the purchasing power of a unit of farm products in terms of nonagricultural goods. On September 15 the index number indicating this purchasing power was 92, compared with an average of 85 for the year 1926, with 100 representing the average for the five years preceding the war. Since June, 1921, when the depression was at its worst, the unit buying power of farm products has increased more than 35 per cent. This means that agriculture has regained more than three-fourths of the buying power lost per unit of its products in the postwar price decline.

It is important to bear in mind, moreover, that the improvement thus registered in the purchasing power index does not show the full extent of the recovery effected. Index numbers indicating gains in the exchange value of farm commodities tell only part of the story. They do not accurately reflect advantages accruing from increased efficiency. In the last few years the productivity of American agriculture, as measured in output per farm worker, has increased greatly. On fewer acres, and with a farm population 3,000,000 less than in 1919, the agricultural industry since 1923 has averaged a larger volume of production than in the years immediately following the war. This suggests the practical certainty that relative costs of production have been reduced despite continuing high overhead and labor expense, a view that is strengthened by data recently made available showing a tremendous recent increase in the use of large power units in agriculture. Another indication that the purchasing power index does not record all the progress

achieved is the fact that since 1921 net farm incomes, with some recession in 1926–27, have increased more rapidly than the unit purchasing power of farm products. It is a reasonable inference that the farmers, through increased efficiency, are offsetting, to some degree at any rate, the effect of unfavorable relative prices.

Increased Net Income Probable

In the crop year 1926–27 the net income of agriculture, owing mainly to declines in cotton prices in the early part of the season, fell somewhat below the level reached in 1925–26. This year some improvement is expected. Moreover, areas where distress has been acute in recent years are this year marketing good crops at good prices. Montana and parts of the Dakotas are conspicuous examples. Crop yields in Montana were nearly 50 per cent above the average for the last 10 years. In the Dakotas, Nebraska, Idaho, and Oregon yields were from 10 to 20 per cent better than usual. In the Cotton Belt generally, notwithstanding poor yields in certain areas in eastern Oklahoma and New Mexico and heavy losses from flood damage in the Mississippi Valley, farm returns are expected to be up to the average of recent years. The troubles of the farmer are not yet over, but the balance of the year's developments is on the side of progress.

Although unfavorable weather delayed planting, and the season started under discouraging conditions, production of the principal crops was estimated in October to be 1 per cent above the average during the last five years and only 1 per cent below that of 1926. This result was obtained on a crop acreage about 1 per cent less than that of last year. Such an achievement is surprising in view of the difficulties encountered. Growers of cotton and tobacco faced low prices at planting time. In Florida and in a large area extending through southwestern Kansas, western Texas, and eastern New Mexico long-continued drought damaged growing crops. Floods covered 4,500,000 acres of crop land in the Mississippi Valley. Up to June 5 only a fourth of the intended corn acreage had been planted in the lower Ohio Valley, and only a half in a large part of the eastern and central Corn Belt. Yet the total crop production, besides being above the average of recent years, is so well balanced that no marked scarcity exists of any product. Previous heavy stocks of cotton, tobacco, and canned goods will be reduced, but this is a favorable change. As far as weather conditions permitted, farmers planted the best-planned acreage in many years. Few signs of excessive production are evident with the exception of hay.

Striking Change in Cotton

The most striking change in the agricultural situation this year, as compared with that of 1926, is in the Cotton Belt. The year's cotton crop was estimated in October at 12,672,000 bales, compared with 17,977,000 bales produced in 1926. From the standpoint of price the improvement has been remarkable, and it is estimated that should cotton prices continue at their present level, returns to farmers for lint alone will exceed by about $150,000,000 the income from last year's crop. Acreage reduction, boll-weevil damage, and the Mississippi floods mainly account for the fact that this year's cotton crop is nearly one-third smaller than that of last year.

Cotton area this year as estimated in September was 40,626,000 acres, compared with 47,087,000 acres picked last year. Although floods in the Mississippi Valley accounted for some of the reduction in cotton planting, the farmers themselves, acting on the advice of Federal and State Departments of Agriculture, agricultural colleges, and cooperative marketing agencies, effected much of the reduction voluntarily, thereby showing that intelligent action to readjust production to demand in agriculture is practicable on a large scale.

In the Corn Belt production of corn is 10 per cent greater than last year, although 1 per cent below the average production of the last five years. For the country as a whole, the corn crop is estimated at 2,753,000,000 bushels, compared with 2,647,000,000 bushels harvested last year and a five-year average of 2,767,000,000 bushels. This production was the greatest surprise of the season A late start and slow growth made it seem almost inevitable that much of the corn crop would be caught by frost. In the eastern and central Corn Belt, from western Pennsylvania to western Iowa and Minnesota and south through Kentucky, yields were unfavorable. West of this region, however, conditions were good. Nebraska's corn crop was nearly twice as large as that of last year, and that of Kansas three times as large.

Corn-Belt Situation

Corn prices advanced during the summer to nearly $1 a bushel at local farm markets, compared with about 65 cents in the summer of 1926. On September 15 the average farm price of corn was 95 cents, compared with 76 cents in September, 1926. This advance in corn prices, however, is partly offset, from the standpoint of Corn-Belt incomes, by lower hog prices. It is, therefore, doubtful whether the Corn Belt will effect as much improvement in its financial situation this year as some other sections. Decreased foreign demand has been a factor in the decline of hog prices, although increased marketings have played a part also. However, cattle feeding, an important source of income to the Corn Belt, should give increased returns.

The Wheat Belt, especially the northern part of the winter wheat and all of the spring wheat area, has had a good year. Spring wheat was a large crop, and wheat prices have held up fairly well. Taking spring and winter wheat together, the country harvested its largest wheat crop since 1922. A prospective increase in the world wheat supply is causing the crop to be marketed at prices slightly lower than those prevailing last year. Desirable milling wheat for domestic consumption, however, has given returns to the grower of at least 15 cents a bushel above the value of the export grades. At Kansas City choice dark hard winter wheat has been commanding premiums as high as 35 cents a bushel. On one car at Minneapolis a premium of 65 cents a bushel over the December future was paid. This car showed 16 per cent protein. Our export wheat consists generally of the nonpremium grades.

Moreover, production costs have been reduced through technical progress, particularly in the spread of combine harvesters. Accordingly, wheat growers with arrears of indebtedness left by the postwar depression have been able to diminish their obligations.

Wheat production is estimated at 867,000,000 bushels, compared with 833,000,000 bushels harvested last year and a five-year average

of 808,000,000 bushels. Winter wheat comprised 553,000,000 bushels of the total. Durum production was 80,000,000 bushels, and spring wheat other than durum 234,000,000 bushels. All spring wheats gave remarkably good yields.

Oats Crop Below Average

Oats had a poor start, and the total crop is estimated at 1,206,000,000 bushels, or about 4 per cent less than the quantity harvested last year and 10 per cent below the average production of the last five years. Barley, planted on a largely increased acreage, yielded 265,000,000 bushels compared with 188,000,000 bushels last year. Increased acreage planted to buckwheat and a yield close to the average make the out-turn of that crop nearly 15,800,000 bushels, the largest since 1918. Unusual yields of flax on a slightly reduced acreage gave a production of about 24,300,000 bushels, the second largest production of flax in 15 years. Rice production, estimated at 37,900,000 bushels, is close to recent average output.

Conditions have greatly improved in tobacco-growing sections where depression was marked last year. This year's production will be marketed under relatively favorable conditions, accumulated surpluses of old leaf having been largely cleared away. However, in the Southeastern States, where production was stimulated by favorable prices in 1926, conditions this year may be not quite so favorable as they were last year.

Tame hay, a crop largely fed to livestock on the farms where it is grown, was the largest crop on record. It is estimated at 103,800,000 tons, compared with 97,622,000 tons produced in 1924, the previous high-record year. On an increased acreage abundant rainfall gave large yields in practically all important hay-producing States. Yield of wild hay per acre seems likewise to have been unusually large.

Cattle and Sheep Industries

Good conditions prevail in the cattle and sheep industries. The average price of slaughter steers at Chicago in September, 1927, was $2.63 per 100 pounds higher than a year ago. This is an advance of about 25 per cent. Some of the better grade steers averaged as much as 35 per cent higher than a year ago. Stocker and feeder cattle showed a 19 per cent advance for the year. Top slaughter steers in Chicago about the middle of October sold up to $17.25 per 100 pounds, compared with a top of $12.70 in October, 1926. Cattlemen are optimistic and are restocking their ranges. Accordingly, marketing of cattle has been less than last year. This year's incomes from cattle sales will therefore not record the full improvement made in the situation, notwithstanding the fact that such incomes will be unusually satisfactory. The cattle industry is accumulating resources which should be reflected in satisfactory incomes for several years. Statistically, the beef industry is in an exceptionally strong position. Provided production is not overdone and emphasis is placed on good-quality cattle, it should hold its advantage for a considerable period. Market supplies in the fall were materially smaller than for some years, and prices for approximately all classes and grades of cattle were remunerative to both ranchmen and feeders, especially to the more efficient ones.

Although the market price of lambs has averaged somewhat lower this year than it did in 1926, the sheep industry as a whole remains in good shape. Sheepmen generally have prospered. In a market so narrow as that for lamb and mutton, there is always danger of overproduction, and the tendency toward expansion which has been manifested by the sheep industry for several years past suggests that this danger should be kept in mind. Nevertheless, markets have not been glutted and prices have remained profitable. Moreover, consumption of mutton and lamb probably can be increased. Wool prices have remained on a steady and firm level and have been fairly profitable to growers. Imports of combing and clothing wool were approximately 100,000,000 pounds less than in the preceding year, and sales at primary markets developed decided strength.

The Swine Industry

From the standpoint of prices, the swine industry encountered relatively unfavorable conditions this year, although neither production nor market supplies were excessive. From February to the end of the summer hog prices declined approximately $3.50 per 100 pounds. This decline resulted primarily from a sharp curtailment in the foreign demand for American pork and pork products. In some countries the reduction amounted to 50 per cent compared with takings in 1926. Fortunately much of the American pork marketed in the earlier part of the year was produced on relatively cheap corn. In the late summer, the corn-hog price ratio became unfavorable for the hog producer and suggested the necessity for readjustments in production. In September and October, however, corn prices declined and hog prices advanced. At this writing the corn-hog price ratio is not unfavorable for hog feeding.

The Dairy Industry

The dairy industry has enjoyed another good year. Although the general trend of dairy production continues upward, consumption of all dairy products has more than regained the momentum acquired before the war and the outlook is favorable. Estimates of total market production in the United States during recent years show that there has been an average annual increase of about 4,000,000,000 pounds of milk. This increase has been absorbed for the most part by increased consumption of fluid milk and butter. Some important shifts are taking place in the manufacture of dairy products. Cheese production is declining, owing, in part, to an increased demand for milk for other uses. On the other hand the production of condensed and evaporated milk is increasing. The future prosperity of the American dairy industry depends largely on the domestic consumption. If, as is probable, this continues to increase, the outlook is encouraging, because existing tariff duties give reasonably effective protection from foreign competition.

Poultry Outlook Improved

In the poultry industry conditions have been somewhat less satisfactory during the last year than in 1926. Egg production was heavy until June 1, 1927, and low prices failed to stimulate consumption sufficiently to absorb the increased output. Marketings of

poultry likewise were heavy enough to offset severe price concessions. During 1927 all classes of poultry sold at prices below those of the previous year. At the same time poultry feeds advanced in price. Toward the middle of the year, however, a tendency toward improvement appeared, and by fall a recovery was well under way. Declining market receipts of eggs, an accelerated movement of eggs out of storage, and the reduction in stocks of frozen poultry to normal levels have put a new face on the situation. The poultry industry is now in better shape than at any previous time this year. Apparently production has been sufficiently curtailed to enable the industry to go ahead on a sound and profitable basis.

Fruits and Vegetables

Most staple lines of fruits and vegetables, with the exception of potatoes and sweet potatoes, are bringing prices equal to or considerably higher than those of last year. Tree crops have been lighter than in any recent season. Commercial apple production was estimated in October at about 24,300,000 barrels, compared with 39,400,000 barrels last year, when the output was the heaviest on record. The crop is about evenly divided between the Western States and the eastern and central apple regions, the big drop in production occurring in the latter area. Prices in the principal markets on October 1 were from 50 to 75 cents a bushel higher than for the previous year, although the quality of the supply was lower. Peach production dropped about one-third from the heavy crop of 1926, and peach prices ruled generally higher. Pear production likewise declined materially. These lower production results were accompanied by price gains promising increased total returns.

Strawberries, with a production of 329,336,600 quarts, showed a large increase over the 274,429,000 quart crop of 1926. Estimated production of grapes is 2,550,000 tons, an increase of 450,000 tons over the five-year average prior to 1926. A record crop of 18,000,000 bushels of late onions is expected, or 4,500,000 bushels above the five-year average. Cabbage production is also higher. Despite the increased production, prices of both cabbages and onions are about the same as a year ago.

Potato production on October 1 was estimated at 395,000,000 bushels, or 39,000,000 bushels more than in 1926 and 1,000,000 bushels more than the average for the five years preceding 1926. Potato prices have been from a fourth to a third lower than those of a year ago. Sweet potato production is expected to total 87,500,000 bushels, or 3,800,000 more than in 1926.

Foreign Markets

Record export shipments of cotton and fruit and substantial increases in exports of wheat, rice, and rye, with a marked decline in pork-product shipments, feature in the foreign-trade record for 1926–27. Quantities were higher than in any year since 1921–22, but low prices caused comparatively low returns. Agricultural products constituted 42 per cent of export values as compared with 48 per cent in 1924–25.

Low prices, appealing to European buyers, and economic recovery in Europe explain the record shipment of 11,281,000 bales of cotton. Economic recovery, coupled with low production in Europe, de-

manded exports of wheat and flour 103 per cent greater than in the previous year and 90 per cent more valuable. California rice, produced in abundance, was exported in considerable quantities to Japan. Southern rice growers sold in Europe and Latin America.

The coal strike in Great Britain and civil disturbances in China limited the demand for bright flue-cured tobacco, and exports declined 11 per cent. Germany and the Netherlands, however, took larger quantities. These two countries and Spain and Belgium also bought more of the heavier tobaccos, which more than offset light purchases by the United Kingdom and France.

Heavy fruit crops in the United States and light ones in Europe in 1926 favored heavy exports of apples and other fruits. Germany's takings of apples increased 250 per cent. Exports of oranges and grapefruit increased, and the presence of so many fresh fruits on the European markets made prune prices so low that the 15 per cent larger export was 5 per cent less valuable. Demand for pork products declined. European production recovered somewhat, and the British quarantine on continental cured pork kept continental products at home.

For the immediate future the textile situation is not favorable in Great Britain, France, and Italy. Germany, central Europe, and most of the other European buyers, with the exception of Denmark and Norway, are more favorably situated and current demand should continue. Chinese disorder, reflected also in Japanese textile depression, does not promise a good market in the Orient.

A tendency continues for imports of dairy products to exceed exports increasingly. Exports of condensed and evaporated milk declined 20 per cent. Butter prices abroad were consistently lower than in the United States, and at times this margin exceeded the 12 per cent tariff and resulted in imports. In recent months the foreign prices have increased and this has reduced the pressure on the domestic market.

Farm Position Still a Problem

In general the showing for the year is good. Yet much remains to be done before the position of the farmer will cease to constitute a problem. In order to achieve higher net incomes for agriculture, advance is necessary along several lines. While farmers themselves are reducing their costs of production through increased efficiency, public agencies should cooperate with them in effecting a better adjustment of production to demand. Also efforts should be made to diminish waste, to lessen margins between producers' and consumers' prices, to reduce transportation and distribution costs, and to lessen the farmer's overhead charges by lowering or redistributing tax burdens and by improving agricultural credit facilities. Farmers should be encouraged to enhance their bargaining power through cooperative marketing, and the responsibility of the public in helping to reduce price fluctuations due to unavoidable gluts and shortages of agricultural products should be recognized in a practical manner. Overemphasis on the fairly satisfactory results of a single year may cause us to forget the existence of underlying causes of farm difficulty, and therefore to neglect practicable means of affording relief.

TECHNICAL PROGRESS SINCE THE WAR

Thus far I have discussed the current situation. It is impossible, however, to gauge the condition of agriculture on the basis merely of this year's yields and prices of farm commodities. Such data may tell us where the agricultural industry stands, but not the direction in which it is headed—and in agriculture long views are imperative.

The best way to visualize the future of agriculture, as of any industry, is to examine and apply the examples of its recent past. If the farmer has tackled his problems sensibly and energetically, with resulting increase of efficiency in both production and marketing, his outlook may fairly be considered good. This he has done in a manner which has no historical parallel. Technical progress in American agriculture has taken place at an extraordinary rate since the close of the World War, and in consequence the productivity of the individual farmer has been increased, while at the same time the agricultural industry as a whole, through the shifting of crop enterprises, has been better adapted to its market conditions.

In the nine years since the World War ended, our agriculture has undergone far-reaching changes that have materially increased the output of both land and labor. Tractors have replaced many horses and mules, releasing land for other uses than the production of feed and forage. Improved harvesting machinery has come into wide use. The size of the average farm has increased. More productive crops have been planted. Livestock of increased productivity has become widely dispersed. Farm management has become more efficient, a better balance has been established among agricultural enterprises, and progress has been made in adjusting production to market requirements. The result is an increase in farm production more rapid than the rise in the country's population.

This augmented production has been obtained on a decreased crop acreage and with fewer farm workers. Here is evidence that agriculture has not lacked vigor or resourcefulness in the trying years of the postwar depression. Here also is an augury of its future prosperity. Although the increased production of the postwar period undoubtedly has tended to depress farm commodity prices, it has probably been associated with a decrease in production costs; and it is not the price of a commodity, but the margin between that price and its cost of production, that determines the farmer's profit. Farm efficiency has been increasing, and efficiency in production coupled with a better adjustment of production to market requirements is a corner stone of agricultural prosperity.

Decrease in Crop Land

From 1919 to 1924 there was a decrease of 13,000,000 acres in crop land in the United States—the first decrease ever shown by census statistics in the agricultural area of the Nation. There occurred at the same time a decrease in the number of farm animals, a decrease in the number of farms, and a decrease of farm population. Under such circumstances one would hardly expect an increase in the volume of farm production. Yet an increase took place, and a very substantial one. It is estimated that crop production in the period 1922–1926 was nearly 5 per cent greater than in

the period 1917–1921, although the aggregate acreage in crops decreased slightly. Likewise, the output of animal products is estimated to have increased fully 15 per cent. The increased productivity of the farm worker is estimated at about 15 per cent. This increase in labor efficiency, probably never before equaled, is attributable in part to the utilization of more productive livestock and crops, in part to the increased use of machinery and power on the farm.

Better Utilization of Feed

Important gains have been made in the amount of milk and meat produced per unit of feed consumed. About two-thirds of the estimated increase in farm production for the five years 1922–1926 over that for the five years 1917–1921 is attributable to an increase in the output of animal products. In the later period about 20 per cent more milk was produced from only 4 per cent more dairy cows and heifers, and the output of meat and other animal products in relation to feed consumption increased about 9 per cent. Fully one-third of this increase, however, is due to a shift from beef cattle toward dairy cattle and hogs. These animals produce more human food per unit of feed consumed than do beef cattle.

Changes in crop production contributed to the increase in total farm output. In general, the crop shifts made were toward crops with a higher acre value. In the Cotton Belt there was a notable shift from corn to cotton. In the western Corn Belt and in the spring-wheat region a marked shift from wheat to corn took place. California and Florida largely increased their acreages of fruits and vegetables. About two-thirds of the increase in crop production per acre between 1922–1926 and 1917–1921 is associated with this shift from less productive to more productive crops per acre, while the remaining third is attributed to higher yields per acre.

Various agencies have assisted farmers in effecting this progress, among them the agricultural press, farm organizations, agricultural colleges, experiment stations, extension services, and the Federal and State departments of agriculture. My present purpose, however, is not to list the parts played by these different agencies in increasing the efficiency of agriculture, but merely to note certain indications that the American farmer is dealing effectively with the problem of putting his business on a paying basis.

Accelerated mechanization since the World War has released for other uses from 15,000,000 to 20,000,000 acres of crop land formerly required to feed horses and mules. Only an imperfect indication of the scale on which power has come into use in agriculture recently is given, however, by statistics showing decreases in the number of mature horses and mules on farms. Thus, on January 1, 1920, the number of these animals on farms was 21,873,000. By January 1, 1925, it had dropped to 20,619,000, while at the same time the number of tractors on farms had increased from 246,000 to 506,000. A large increase has taken place also in the use of stationary gas engines and electricity on farms. Motor trucks and automobiles, of course, have increased greatly the power available for transporting farm products to market. In this five-year period the increase in mechanical horsepower on farms was probably five times as great as the decrease in animal horsepower.

Tractors on Farms

In regions where industry has been expanding rapidly and paying wages higher than farmers can afford, the increase in the number of tractors in agriculture has been extraordinary. The increase has been greater in Pennsylvania, New York, the Lake States, the eastern Corn Belt, and California, where the farms are of medium size, than in the Central States and far West, where the farms are larger. This should not be taken to imply, however, that the increase in the use of power machinery has been small in the latter regions. In these regions a great increase in the use of large power units has taken place.

Power machinery, besides increasing the productivity of the individual farm worker, influences the size of farms, the distribution of crops, and the choice of farm enterprises. Census data indicate a decrease in the number, accompanied by an increase in size, of farms in some States where the number of tractors has greatly expanded. In western Texas and Oklahoma, where large power units are in general use, the amount of crop land cultivated per man is much greater than in the "old South."

Effects of the wider use of power machinery are also to be seen in the movement of corn production westward and northward since the war. Census returns show a large increase in corn acreage northwest of a line drawn from central Oklahoma diagonally across Missouri and Illinois to Lake Michigan. In the States south and east of this line there has been an almost equal decrease. Lower costs of production, made possible by power machinery, tend steadily to push the arid margin of crop production farther west, a movement that is forwarded by the development of short-season and of drought-resistant varieties of corn.

These influences are still more striking in the case of wheat. Census figures show that between 1919 and 1924 wheat acreage was extended considerably into the semiarid region in the Great Plains. Moreover, in all the States in this region, except New Mexico, the acreage of wheat since 1924 has continued to increase, while at the same time the number of farms has diminished. This is evidently due in part to the influence of power machinery.

Another consequence of the spread of power machinery in agriculture is the expansion of agriculture into regions where conditions largely necessitate specialized, as distinguished from diversified, agriculture. Such regions exist in the Great Plains, where wheat growing has undergone considerable expansion in recent years, and in Texas and Oklahoma, where there is a tendency toward specialization in cotton growing. It is largely machinery that enables farmers to enter such regions and raise crops profitably.

This tendency toward specialization in certain areas has undoubtedly influenced farming practices elsewhere. The competition of areas exceptionally well adapted to power farming tends to eliminate the growing of small grains on some farms in the older farming sections. In the Great Plains, farms growing small grains have increased in number in recent years, while in the country as a whole the number of farms growing wheat and corn for grain has decreased. It is not improbable that there is indicated here the beginning of a process of geographic specialization in the production of

crops adapted to mechanized farming. Probably the types of agriculture suited to power cultivation will be more and more concentrated in relatively level areas where large farms are practicable, while the older farming regions may tend to concentrate increasingly on diversified farming.

Diversification Possibilities Limited in Some Areas

A system of farming which includes a number of different crops and one or more livestock industries naturally runs less risk of complete seasonal failure than a system based on a single crop or a single livestock industry. Diversification of crops reduces climatic and economic hazards, promotes crop rotation, facilitates the control of plant insects and plant diseases, and permits an efficient employment of labor, power, and machinery throughout the year. In certain regions, however, such as on the dry lands of the West, the possibilities of diversification are limited. Much of the arable land there has accordingly been used extensively for wheat growing. Ranch resources are utilized by cattle or sheep. Special crop or livestock industries of this sort are subject to great climatic hazards. Yet in the semiarid region it has not been found practicable to accomplish much through diversification of crops. Progress in the efficient utilization of semiarid lands has been made, however, through cheaper methods of production and improved credit facilities.

In manufacturing industries great progress in reducing production costs has been made by mass production. This method, which is essentially one of job specialization, has its counterpart in certain branches of agriculture, particularly cotton and wheat growing. It has been possible by specialization greatly to reduce the cost of producing these crops. By the use of larger operating units, more efficient power and machinery, and skilled labor, crop specialization has often effected important economies. The system, however, suffers the disadvantage of seasonal hazards which may be so severe as to result in partial or complete crop failures.

These hazards must clearly be offset by the profits of favorable seasons if the enterprises in question are to continue. In certain regions this is normally the case. Sometimes, however, farmers are not able to take advantage of this circumstance because they are without suitable credit facilities. Capital or credit to carry his operations through only one season is not sufficient for the specialized crop farmer. What he needs is a credit system adapted to the peculiar conditions of his business. In other words, his credit facilities must enable him to take advantage of the fact that in the long run seasonal crop failures are likely to be more than offset by the profits of favorable seasons. Something has already been done to meet this necessity, but it ought to be possible to make better provision for it.

It is well to bear in mind, when considering the problems created by the recent extension of crop specialization, that not all development of this character is sound. In the war period much land was planted to grains which had better have been left in grass. In certain areas where specialized farming has been attempted the seasonal hazards are so severe as not to be sufficiently compensated by the profits of good years. What I have said as to the desirability of

adapting credit conditions to specialized farming applies only to districts where that type of agriculture has a reasonable chance of success. Specialized farming, in short, ought to be pretty definitely based on assurance that long-time crop prospects, coupled with the saving in production costs that specialization permits, adequately offset the inevitable risks and losses of the enterprise.

Increased Efficiency Promoting Prosperity

The increased efficiency that has resulted from the spread of improved machinery and larger power units, and the wider application of improved practices in American agriculture since the war, will in the end be a strong influence in restoring agricultural prosperity. When efficient practices are not in general use in all competing countries, the country first adopting them has a great advantage. Nevertheless we must not forget that the gain accruing to the agriculture of the United States as a whole from rapid technical progress is accompanied by loss, and perhaps failure, for individual farmers who can not keep up with the advance. Increased efficiency resulting in an increased output per worker may necessitate a reduction in the number of farmers. Rapid economic readjustments are always painful for some of the producers involved. Our more progressive farmers are selling or slaughtering their poorer farm animals and breeding from the better stock. They are using better seed, adopting better crop rotations, increasing their yields per acre of certain crops, and making heavy investments in power machinery. Those who can not follow this example find their position increasingly difficult.

This is shown by certain problems that have arisen in the Cotton Belt through the rise of large-scale methods of cotton growing in Texas and Oklahoma. In the older cotton States thousands of farmers are finding that periods of technical progress in agriculture are also periods of keener competition. Crop enterprises like cotton growing, in which American production dominates the world market, feel such conditions much more keenly than others—wheat growing, for example, in which our contribution to the world's supply is a relatively small part of the total. In the decade from 1910 to 1920 the annual cotton acreage in the United States was about 30,000,000 to 35,000,000 acres, with no upward trend apparent. Then came an enormous increase. Between 1922 and 1926 our cotton area increased from 33,000,000 acres to nearly 48,000,000 acres. This year, according to an estimate made in October, nearly 41,000,000 acres were harvested. Such expansion obviously implies keen competition in raising cotton.

Increase in Texas and Oklahoma

Although cotton acreage underwent expansion in the Cotton Belt generally between 1922 and 1926, the increase was most pronounced in Texas and Oklahoma. In the Eastern States part of the increase resulted from the resumption of cotton growing on lands that had gone out of cotton in the preceding period of low returns and high production costs, due to the boll weevil. Much of the increase in Texas and Oklahoma, however, was on virgin land formerly in cattle ranges. In the newer cotton areas of Texas and Oklahoma methods of production have been developed with which the older cotton States

find it difficult to compete. The land is level, farms are laid out in regular fields well adapted to the use of large machines, the soil is friable, easy to work, and comparatively free from weeds, and much of the area is not infested with the boll weevil. Under these conditions one man, using large implements and large power units, can plant and care for 75 to 150 acres of cotton, usually without hiring labor up to the time of picking. In the Piedmont district and in the Coastal Plains section of the eastern Cotton Belt the usual area handled per man is 10 to 20 acres of cotton and a similar acreage of feed crops.

In 1926 the cotton sled or stripper came into general use for harvesting cotton in parts of western Texas and Oklahoma. With this device one man can gather as much cotton in a day as 8 or 10 men can pick by hand. Most of the sleds used last year were crude and did not save all the cotton grown. Moreover, the cost of ginning sledded cotton was usually higher than the cost of ginning hand-picked cotton. Nevertheless, under the conditions that prevailed at that time, with cotton low in price and harvest labor dear, harvesting by the sled had a marked advantage. In all probability this mode of harvesting cotton in the newer cotton areas has come to stay, at any rate pending the development of a better method. Low-cost methods of growing and harvesting cotton in this region have reached a pitch of efficiency which may enable the farmers there to earn profits even in years of comparatively low prices. Accordingly, crop enterprises in the older cotton States may have to be readjusted somewhat. It is fortunate, therefore, that opportunities exist for some cotton farmers who have been devoting all their energies to cotton to turn to other crops and make cotton a relatively less important part of their business.

Changes in Wheat States

Significant changes have appeared likewise in the wheat-growing States. Wheat prices since 1924 have permittted or encouraged an expansion of wheat production in some regions. The area of winter wheat sown in the United States increased from 40,000,000 acres in 1924 to nearly 43,000,000 acres in 1926, and farmers reported this fall an intention to sow about 48,000,000 acres. In the last three years the farm price of wheat has averaged $1.28, $1.46, and $1.23 a bushel. These prices are compared with 92 cents for the marketing season 1923-24, and a pre-war average of 89 cents. In relative purchasing power, however, wheat has averaged lower during the last few years than before the war. It seems, therefore, that under certain conditions wheat production is being maintained or expanded in the United States at relatively lower prices than before the war.

Recent changes in our wheat map throw some light on the nature of these conditions. As already noted, the recent expansion appears in the new lands of the Great Plains region. Elsewhere the acreage is contracting. East of the Mississippi the acreage in wheat in 1924 was only 10,000,000 acres, compared with 12,000,000 acres in 1909. Recent expansion in our winter wheat acreage is almost entirely accounted for by increases in acreage in Nebraska, Kansas, Oklahoma, and Texas, in which States the wheat area increased from 18,500,000 acres in the fall of 1923 to 22,600,000 acres in the fall of 1926. Spring

wheat acreage in western North Dakota and Montana has undergone expansion likewise, offsetting reductions elsewhere.

In these areas wheat production is stimulated by the combination of cheap lands, improvement in methods of using such lands, more extensive use of machinery, and ability to produce high protein wheat which brings a premium on the domestic market. The tractor and the small combined harvester-thresher have been powerful factors in this development.

Eastward March of the "Combine"

In 1927 a large part of the grain in many sections where expansion has been taking place was harvested by the "combine." Half the wheat in Kansas was harvested in this way. The machine, a small prairie type of which was introduced in the Great Plains region about 10 years ago, enables two men to harvest from 400 to 500 acres of grain in 15 days of actual work. Combine harvesting is estimated to reduce the amount of labor required for harvesting and threshing 400 acres from 120 days of man labor to 30 days. Where conditions are best adapted to combine harvesting its advantages are striking. In the Great Plains region, according to field studies made by the department in cooperation with State experiment stations, the combine lowers the cost of harvesting and threshing, reduces the amount of labor required, shortens the harvesting and threshing period, and reduces waste of grain. Practically eliminating the need for transient harvest help, the machines economize household labor as well as field labor, adding materially to the savings. Combine harvesting is rapidly spreading eastward. In Illinois this year more than 300 combines were used. Indiana farmers used more than 50. Combines have also been introduced into Pennsylvania, Delaware, and Virginia.

All this technical progress has raised the question of the relation between increased efficiency and the prices of farm products. It has been suggested that the advantage of increased efficiency to the farmer may be largely offset through increased total output and reduced prices per unit of product. This is a problem which demands consideration. It may sharpen the necessity for a better adjustment of production in agriculture and for a better relationship between the agricultural population and other groups. There can not, however, be any justification for lessening the effort to attain increased efficiency. Such effort may return a diminishing total reward as the percentage of efficient producers increases, but the gain probably never vanishes altogether, and for the pioneer in efficiency it is substantial. Efficient methods have to be applied almost universally before their benefit goes mainly to the consumer. In the case of crops like cotton and wheat, the prices of which are determined in the world market, it is especially important that the highest possible level of efficiency be maintained by American farmers. Undoubtedly, however, progress in efficiency which causes production to keep pace with or to outstrip consumption calls for compensating adjustments in our agricultural system. Under present conditions it is probably unwise to bring more land into use, and I shall have more to say on this question later. While continuing our efforts to obtain increased productivity per worker, we should do

what is possible to prevent unnecessary expansion of crop acreage and to increase the income of agriculture by better adjustment of production and marketing

COOPERATIVE MARKETING

Changing methods of marketing effect progress in agriculture as surely as do changing methods of production. New conditions demand new marketing machinery. Concentration of population in large centers and the development of highly specialized commercial agriculture make necessary an integration of marketing and production. Cooperative marketing is the means which farmers have found most helpful to this end. The introduction of modern machinery and production methods in growing wheat or cotton effected no greater improvements, comparatively speaking, than some of the larger commodity cooperative marketing associations have effected in handling butter, citrus fruits, or other products. Increasing complexities of consumer demand are being met by improved marketing services rendered by farmers' cooperative marketing organizations.

During 1926 approximately 2,000,000 farmers transacted about $2,500,000,000 worth of business through their own cooperative associations. The volume of business handled was about the same as in 1925, with perhaps a slight increase. Advances in the volume of business and in the number of members of cooperative associations, however, have not been rapid since 1923. It is rather in their increasing efficiency and stability that cooperative organizations show their most impressive signs of progress. Much has been learned and much has been accomplished in agricultural cooperation since 1920 and 1921, when the present revival of the movement started in this country. It will be useful to examine the extent and significance of this progress.

Postwar Cooperative Experience

In 1920 and 1921 a number of large-scale cooperative associations were formed almost overnight. Their members, for the most part, had no experience in cooperation; problems of marketing were strange to their directors; and their managers, even though experienced business men, were not familiar with the peculiar difficulties and responsibilities involved in the management of a cooperative organization. Many of these associations began to operate with no clear idea of the problems they would encounter. Merchandising and financing policies were only vaguely defined. Many members believed that products could be sold on the basis of monopoly control of the supply rather than by service to customers. There was in many instances an implicit faith that forms and legal remedies would prove substitutes for membership loyalty and business efficiency. That the large majority of these associations have continued to operate is a tribute to the loyalty of their members and the intelligence and adaptability of their management.

The large-scale associations of the present day are in nearly every case pursuing the policy of (1) offering marketing service adapted to the needs of their members, (2) standardizing and improving the quality of the products they handle, and (3) developing efficient merchandising, based on service to their customers and knowledge of

the forces of supply and demand. An illustration or so will serve to show the advances that have been made.

The cotton associations, for example, have adjusted their contracts so as to allow their members to choose the type of service best suited to their conditions. If a member is unable to sell his cotton in the seasonal pool established by each association, he may select the day or month that his cotton will be sold, and will receive the average price of that day or month for the actual grade of cotton which he delivers.

Cooperative Gins Established

The cotton associations, likewise, are taking the first steps in the development of cooperative gins, that is, their plan includes furnishing their members ginning, as well as marketing, service. They are developing also the sale of their cotton direct to mills, so that eventually the associations will perform or control all marketing functions necessary to carry cotton from the farm to the spinner.

The extent to which an association shall extend its functions depends, of course, on whether it can perform these services more efficiently than private middlemen. There are many middlemen agencies giving services which, in their field, would not be improved if they were assumed by a cooperative organization. Private middlemen will continue to perform these functions just as long as the organized producers are convinced that their cooperative associations can not perform them more efficiently. The existence of cooperative organizations stimulates more efficient service from all middlemen agencies.

In their merchandising policies, cooperative associations have made striking advances. The theory that monopolistic control of the supply of an agricultural product is feasible, or that such control, if obtained, solves the marketing problem, is no longer held by informed cooperative leaders and is dying out among the rank and file of the membership. In quite another sense, however, the associations have discovered that they are able to exert a measure of control over the prices at which their products are sold, and that their operations must be reckoned among the price-making factors. The large-scale cooperative assumes this position because, first, a strong selling agency with a knowledge of values is substituted for disorganized, uninformed selling of producers or small organizations. It obtains better distribution of the product; it stimulates demand by improving the quality of the product, by advertising, and by educational work with the trade; and finally, because it is a dominant factor in the industry, it is able to eliminate wastes and needless agencies at country points and in the terminal markets. All these things influence the price at which the product enters into consumption and the net returns to the producers.

Canadian Wheat Pools

The progress of our neighbors in the Canadian Northwest is an outstanding example of the development of efficient cooperative service. The Canadian wheat pools, organized in 1923, marketed last year practically 200,000,000 bushels of grain, over 52 per cent of the crop in the three northwest Provinces of Canada. These

pools have developed their own country elevator system, which has resulted in improved service and savings in local handling charges to their members. They own and lease large terminal elevators. The profits accruing to the members of the Saskatchewan pool from the operations of their terminal elevators exceeded $600,000 for the 1925 crop. The pools also have created a central selling agency, through which they market approximately 75 per cent of their grain direct to domestic and foreign mills, or through mill brokers in foreign countries. In other words, they are developing a broad service for their members, extending from the local elevator, through the terminal markets, to their customers, and are giving the producers of grain the savings of large-scale operations and the informed, efficient management which large-scale business is able to obtain.

Our farmers similarly have demonstrated that they can conduct large business enterprises successfully. More than 150 cooperative associations in the United States each handle business exceeding a million dollars annually. In practically every section of the country cooperative organizations are setting new standards in efficient marketing. The operations of these associations, it is true, are in the hands of skilled men who are not farmers, but marketing specialists. The policies of the organizations, however, are shaped by boards of directors who are producers, and the organizations are successful because the directors have the capacity to formulate sound policies and the intelligence to leave their managers free to carry out these policies.

Large-Scale Operations Essential

Prominent in the development of cooperative marketing at the present time is the formation of large-scale organizations and the enlargement of organizations already in existence. This development is necessary and desirable. Cooperatives must meet the competition of large and well-organized business enterprises, and must have, therefore, whatever efficiency and economy may be obtained through the formation of large operating units. Agencies dealing in farm products must have volume, and they will more readily make contacts with large cooperative units. There is some danger that when emphasis is placed on the development of a big business by business specialists, the control and participation of the farmers may become remote and uncertain. That danger must be resisted, and the fundamental principle of producer control safeguarded. I am confident, however, that this will be done.

NATIONAL FARM LEGISLATION

Proposed national farm legislation has been much discussed in the last few years. Many of the proposals made are fundamentally unsound. Nevertheless, I am confident that the study and discussion devoted to this question have been, on the whole, beneficial. The public has gained a better understanding of farm problems, and much helpful legislation has been enacted, including the intermediate credits act, amendments to the Federal land bank act, the Capper-Volstead Act, the packers and stockyards act, the cooperative marketing act, and the Purnell Act.

A large part of the farm problem—which in fact consists of many problems—must be solved by the individual and cooperative efforts of the farmers themselves. However, there is need for legislation to give further encouragement to large agricultural business organizations owned and controlled by farmers and managed by strong business executives chosen by the producers. In my last annual report I gave at length my reasons for believing that agriculture needs this type of business organization. Here I shall merely summarize my view.

Major farm products and many minor ones are no longer marketed largely in the locality where they are produced. They are sold in distant markets in competition with products from other parts of the country and even from other nations. Hence the farmer is more dependent on the market than formerly. He produces for sale and buys most of what he needs. Forces of national and world-wide scope determine the prices of his products and materially affect his economic position.

Over these price-making forces the individual farmer has no control. Even at best it is difficult for him to alter his production practices because of the limited adaptability of his land and equipment and the varying influence of the seasons. Moreover, farming is done in small units scattered over a wide area. These conditions make united action difficult. But I am convinced that united action is possible, and that it is the greatest single need of agriculture to-day.

This need is generally recognized. Opinions differ, however, as to means of meeting it. Some would assign the task of directly controlling this or that phase of economic life to the Government. They would have the Government either merchandise farm products or enter into agricultural business in some other way. I need not reiterate my opposition to this view. Such a policy would be detrimental to the farmers and in the long run would jeopardize the legitimate functions of Government. I believe that what is necessary can be obtained by the joint effort of organized farmers, with the Government giving such assistance as it may safely give and protecting the public interest by laying down broad rules of policy. This would preserve the spirit of self-reliance and self-help which has been the mainspring of our progress and at the same time promote the unity of action that modern economic conditions demand.

Commodity Basis of Organization

The type of business organization needed I discussed in my last report. I shall merely mention it at this time. We should center attention on the problem of organizing the producers of major farm commodities. Organizations should draw membership mainly from producers in whose scheme of farm management these major products are prominent parts. In this way a natural bond of common interest is established at the outset.

Although the form of organization might vary with the conditions peculiar to each major crop, in principle all such organizations should be the same. Producers in each locality should unite in a local unit, whether organized around a cotton gin, a shipping association, a creamery, a local elevator, or any other appropriate unit. Federation of these locals into regional and national associations

should follow. The object would be to exercise a stabilizing influence in the market, and to market products efficiently. Such organizations can not be developed in a day, but their growth can be accelerated by proper encouragement.

However, Governmental assistance should be given only in response to a demand for it from the producers. It would be futile for the Government to set up organizations in behalf of the farmers without their interest and initiative. Success in such efforts would necessitate some readjustments in our present machinery for agricultural marketing. Some concerns now in the business might have to drop out, and others might find their affairs less profitable. But inconvenience occasioned to individuals by successful cooperation is part of the price of progress. We should endeavor to minimize it without throwing obstacles in the way of advancement. In a sense this problem is analogous to that arising from technical progress in production. Labor-saving machinery and other improvements have often been vigorously opposed by workers fearing loss of their jobs. Yet, such improvements have increased the productivity of labor, and have become the foundation of high wages. I am confident that the type of business organization I have outlined for agriculture would benefit the country in a similar manner.

Adjusting Production to Demand

Such organizations would be helpful not only in the merchandizing of products but also in adjusting production to demand. I believe the time will come when farmers' cooperative institutions will be as firmly established as our great organizations of industry, transportation, and labor. Then the farmer will have more control over his business and more influence in matters of national economic policy.

If these cooperative organizations would help agriculture and be generally beneficial to the country, their development should be encouraged. They are now "infant industries." It has long been our concern to encourage the growth of industry. This policy has been an important reason for our protective tariff, under which, with the assistance of science and invention and the initiative of American business executives, we have become industrially preeminent. It is entirely consistent with established American policy to foster a beneficial agricultural movement in its early stages.

One of the functions of farmer-owned business institutions handling major farm products is to minimize the price fluctuations that result from recurring surpluses and shortages. The commercialization of agriculture and the relatively inelastic demand for some major farm products, together with the necessity which many farmers are under to sell their crops immediately after harvest, have made the question of surpluses increasingly important.

Variations in production from year to year are due to changes in acreage and to variations in yield. Since the latter come mainly from seasonal conditions, they are largely beyond the farmers' control. From 1905 to 1925 variations in yield per acre accounted for 60 per cent of the fluctuations in cotton production, with the remaining 40 per cent due to variations in acreage. Variations in production due to yield per acre of certain other crops were: Corn, 85 per cent; oats, 63 per cent; and tame hay, 47 per cent. It is obvious from

these figures that fluctuations in production, with resulting variations in prices, are a hazard of farming which is to a large degree unavoidable. In view of the connection between this condition and our economic life as a whole, I believe the Government should take cognizance of it and help to minimize the effects of surpluses and shortages. I believe that the public's responsibility in the matter could well be met by concrete assistance to properly organized farmers' business institutions.

Credit Difficulties Complicate Problem

Crop surpluses are often a more serious hazard than they need be, owing to credit difficulties. Many farmers are heavily in debt as a result of the postwar depression in farm prices, and because of speculative plunging during the boom which ended in 1920. Their obligations, along with short-time production loans, are pressed for payment. Consequently many producers are obliged to sell their crop as soon as it is harvested, regardless of the price offered. This, I am sure, is an important reason why the cotton producers sold more than 60 per cent of last year's bumper crop from October to January, despite the fact that the farm price of cotton on the average was less than 11 cents during that period. This problem deserves more attention than it has received.

Mortgage credit is now generally available on reasonable and suitable terms to farmers in all parts of the country, but the same can not be said of farm credit for production purposes. Farmers in many sections, and especially in the South, continue to pay unduly high rates of interest for production credit, and are embarrassed by the early maturity of the loans, which causes precipitate marketing at harvest time. Country banks have availed themselves of the rediscount facilities offered by the Federal intermediate credit banks only to a limited extent. In certain sections agricultural credit corporations have been of service in obtaining production and marketing credit from the intermediate credit banks. But such facilities are by no means generally available.

Lack of proper credit facilities has also retarded the development of orderly marketing through cooperative associations. During the past year rediscounts of farmers' notes have been available to banks and credit corporations at a rate of 4¾ per cent, making the rate to the farmer and rancher on such loans from 6 to 7¼ per cent, and direct loans to cooperatives have been made at 4½ per cent. Nevertheless, the benefit of these intermediate rediscount and loan rates has reached only limited numbers. Furthermore, in certain agricultural sections, banking facilities have seriously broken down, and local credit facilities have been even less adequate than usual. Bank failures have been numerous in the west North Central and South Atlantic groups of States.

Extension of Merchant Credit

Much of the production credit needed by southern farmers is extended by merchants rather than directly by banks or other credit institutions. Merchant credit is usually much more expensive and is in other respects less satisfactory than cash credit. Although in

the last year or two there has been some increase in the direct use of banks and credit corporations by farmers as against the practice of purchasing on time from merchants and dealers, the latter method is still too common. It would be better for all concerned if as a regular practice production credit could be obtained direct from banks or other specialized credit institutions and purchases made for cash. Although bank credit for production purposes often costs the cotton farmer as much as 12 per cent, with 10 per cent a very common figure, merchant credit not infrequently costs 40 per cent more when all charges in connection therewith are figured on an annual interest basis.

Whatever the source of production credit, the cost should be reasonable and the terms and conditions such that the farmer is not forced to market his crops immediately after harvest without regard to the state of the market. In reply to a questionnaire sent out in December, 1926, 3,431 cotton growers gave information as to the marketing of the 1926 crop. Of the above number, 2,639 reported that they marketed their crop as soon as ginned, and of those who thus sold from the gin 978, or about 37 per cent, gave their credit obligations as the reason for such action. Credit arrangements should not militate against orderly marketing. Facilities for production and marketing advances should be expanded and improved so as to avoid needless pressure for the precipitate sale of farm products to meet obligations incurred in their production.

Under existing provisions of law, one outstanding need in the field of agricultural credit can not be met either by the land banks or the intermediate credit banks comprising the Federal farm loan system. This is the need for relatively long-term mortgage credit to finance the plant and equipment of cooperative marketing associations. Private facilities hitherto relied upon have proved inadequate. Funds for the purchase of necessary plant and equipment for cooperative associations can not properly be provided by these associations on the relatively short-term basis for which such credit is at present obtainable. A more gradual and systematic liquidation of debt incurred for this purpose should be made possible by some form of mortgage credit running for a suitable period of years.

Largely a Credit Problem

Public responsibility to agriculture in helping to minimize price fluctuations due to unavoidable surpluses is, in a large measure, a problem of suitable credit to hold a part of the surplus crop off the market from one season or from one year to the next. Such assistance need not be a "subsidy" as some critics have called it, but an extension of public credit to help reduce that hazard of farming which is due to unavoidable fluctuations in production and consequently in prices.

As already suggested, national agricultural legislation has been emphasized so extensively in recent years that the public has almost overlooked the sphere of State legislation. In view of the fact that so much has been said in recent years about expansion of Federal influence and subordination of State authority, it is surprising that so little has been said about the sphere of the States in the field of agricultural legislation. A great deal could be done by the States

themselves to put agriculture on a stronger economic basis. This applies especially to State and local banking and to taxation and public expenditures in their relation to agriculture. Farmers in many of the mid-Western States would have been better off to-day had sound local banking prevailed during the war and in the postwar boom.

It is generally too easy under existing State laws to organize new banks. Lenient requirements as to initial capital, and the absence of administrative restraint in granting charters for new banks in communities already well supplied with banking facilities have created an excessive number of small banks. In 1920 the west North Central States had 72.2 banks for each 100,000 population and 19.7 for each $100,000,000 physical wealth, compared with 25.5 and 8 in the east North Central States, 32.2 and 16.6 in the west South Central States, and 15.3 and 4.6 in New England.

Many Districts Overbanked

With due recognition of the fact that the number of banks is necessarily larger on the per capita basis in the sparsely settled parts of the country than in the highly urbanized East, there is no denying the fact that many of our agricultural communities are overbanked.

Small banks, created under lax laws and inadequate restrictions, are often headed by men lacking the necessary training and experience. In times of prosperity, extreme competition in an overcrowded banking field leads to reckless investments and creates a condition of too easy credit resulting in extreme optimism and unwise borrowing. Stimulus to land speculation is one of the results, and land values advance beyond what is justified by returns. Debts thus incurred become a serious burden to the farmer, lead to bankruptcy of individuals, and cause numerous bank failures.

AGRICULTURE AND THE TARIFF

In considering legislation in its relation to agriculture I wish to refer briefly to the tariff. I discussed this subject in detail in my last annual report. Here I will merely reiterate my view that the tariff on agricultural products should insure the home market, as far as possible, to the American farmer. Many branches of agriculture derive substantial benefit from the tariff. It should be possible, however, by impartial study of the manner in which tariff duties affect different commodities, to devise means of increasing this benefit. Trustworthy statistics are not available to show the degree to which the advantages of the tariff to agriculture are offset by disadvantages due to its effect on the commodities that farmers buy. Any discrimination which may exist should be ascertained and corrected. This, I am convinced, would be welcomed by American farmers who, on the whole, want to be shown what their position is in our tariff structure.

As I said a year ago, I believe the time is coming when the tariff will be of more importance and more value to agriculture than to industry in the United States, since agriculture is becoming less and industry more dependent on foreign markets. In order to get the best results from the tariff, research should be undertaken to deter-

mine precisely what duties should be placed on farm products, article by article, to insure the home market to the American producer. It should be our aim to give agriculture protection against foreign competition in our markets equal to that enjoyed by industry and labor. In a protected market the benefits of efficient agricultural production and marketing will be greatly increased.

TAXATION AND THE FARMER

There has been no outstanding change in the farmer's tax problems in the past year. As this subject was discussed at considerable length in my last annual report, I shall devote little space to it here, although it remains one of the important farm problems.

Taxes on farm property in 1926 amounted to over $800,000,000. Other taxes paid by farmers to State or local units brought the total about 10 per cent higher. The Federal Government collected from farmers and corporations engaged in agriculture, in the form of income taxes, an amount estimated at $10,000,000 to $15,000,000. Thus farmers and owners of farm property contributed to the various governmental units in 1926 a sum only a little less than $900,000,000 through direct taxes. The total taxes collected directly from farmers in 1914 were estimated at somewhat less than $350,000,000. In the 12-year period from 1914 to 1926, the direct contributions of farmers to the support of the various governmental units have thus increased more than 150 per cent. Gross value of farm production increased only about 60 per cent during the years from 1914 to 1926.

During the past few years the department and several cooperating agencies have obtained reports on the relationship between the income from agricultural land and taxation. These reports have indicated that in many sections of the country taxes have on the average amounted to fully one-third of the net income. That is, after the owners of farm land who reported to the department have paid their other expenses and have made a small allowance for depreciation on their buildings they find it necessary to pay over 30 cents of every remaining dollar for taxes.

Causes of Increase in Taxation

Increases in taxation that have come in the past decade have three main causes: (1) Increase in population; (2) rising price level; and (3) increased demand for govermental services. The first two of these need little explanation. Many governmental expenses are increased as population increases. There is a normal addition to the amount of taxes that must be collected when population grows. When the price level rises, it is to be expected that such expenditures will increase, since most governmental expenditures are for articles or services that are bought on an ordinary commercial basis. These two causes of increase account, however, for only part of the rise in expenditures. The remaining increase consists mainly of the cost of new or increased services that governmental units have been called upon to supply. Expenditures for schools and roads represent a large part of this cost of increased service. The increased use of the automobile has made necessary vast increases in expenditures for roads. To condemn the general increase in governmental expenditures and to con-

tinue to demand enlarged services from the Government is a common inconsistency.

If the assessment of real estate bore some immediate relationship to the current income from such property, the farmers' tax difficulties would be decreased in those sections where at the same time other industrial groups had increased tax-paying ability. Readjustment of assessments is, however, under any conditions a difficult problem, and to try to secure an annual adjustment of assessments to conform to income changes seems to be attempting an impossible task. More can probably be accomplished by improvement in the present system of assessment than by a complete change to the income basis of taxing property, especially in those governmental units where agriculture is the only important industry and where the prevailing type of farming is such that agricultural income in general is mainly dependent on one or on a few crops. Unless the amount to be collected by taxation can be lowered materially, relief for the farmer in an exclusively agricultural section must take other forms.

Tax Relief for the Farmers

That local economies are possible in most sections of the country and that certain expenditures may be reduced without curtailing necessary public service, will be conceded by all who have studied local government. Waste should be eliminated, but legitimate functions of government should be adequately supported. Possibilities of lessening the farmers' tax burdens include: (1) Increased recognition of sources of tax-paying ability other than tangible property; (2) the spreading of the tax base over a wider unit; and (3) improvement of the system of assessment.

The general property tax was used in 1922 to raise 78 per cent of the total amount of revenue collected by the States and their subdivisions. There has probably been little change in the percentage since 1922. This tax falls mainly on tangible property, that is, on property that may be readily found by the assessor; and because the farmer's property is of that type, he bears a particularly large share of the tax. Other sources of ability to pay are reached in some places by State income taxes, by commodity taxes such as those on gasoline, by the various license taxes, and by corporation and business taxes. These are used chiefly by the State governments and are distributed to local units in relatively small amounts.

In many cases a local unit is now required to provide a service which, to a large extent, is regulated by State statute, and which has a social significance that is not limited to the district. This is peculiarly true of education. Owing to the movement of population from the country to the cities, the rural school child is potentially the citizen of some urban community. Should the movement continue, as it probably will for many years, a large number of the children now in rural schools will eventually be city dwellers. Education in youth is essential to good citizenship wherever the citizen may live. Hence, the cityward movement of population makes the standard of instruction given in rural schools a matter of more than rural concern. It appears also, from the fact that the number of children of school age per thousand population is greater in the rural than in the urban communities, that the rural population is

bearing more than its fair share of the cost of educating the rising generation. Increased contributions by the States to rural school districts would seem to be justified. The advantages of such a change to districts with little property to tax would be substantial. In years when such districts were affected by crop failures, local governmental services would be maintained without undue local hardship.

Exemptions Increased

Revision of the Federal tax structure in recent years has not only reduced the amount of taxes collected but has increased exemptions under the income tax to such an extent that relatively few farmers now pay direct taxes to the central Government, notwithstanding the general improvement in farm income since 1921. The farmers' tax problems are primarily State and local, and constitute one important field for State policy in relation to agriculture, a field which has been all but overlooked in recent discussion of farm legislation. Because of differences in economic conditions and in systems of taxation in the various parts of the country, no remedial measure designed to aid the farmer in the solution of his tax problems can be applied equally in each of the 48 States.

LAND-UTILIZATION PROBLEMS

Although the last agricultural census recorded a decrease in the crop land of the United States, the expansion of cotton growing in Texas and Oklahoma and of wheat growing in the Great Plains area shows that the impulse to bring additional land into cultivation must still be counted on as an important factor in American agriculture. In the recent past there has been a relative overdevelopment of agricultural land. More acres have been brought into cultivation than changing market requirements justified, not only in this country, but also in other parts of the world, and power machinery is releasing much land formerly required for forage. This has undoubtedly helped to prolong the agricultural depression, which has prevailed in countries with such widely different systems of farming as England and the United States, as well as in other countries. Recurrence of the difficulty will be less likely if we do what is possible to encourage restraint in the expansion of the farming area, and a better selection of lands to be farmed.

Overexpansion of agriculture in relation to the demand for farm products is in part an unavoidable result of uncontrolled economic forces, but these influences are often supplemented by Government policies for stimulating the increase of the acreage in cultivation. In some countries, of course, conditions appear to justify governmental policies for promoting expansion of agricultural settlement. Australia, Canada, South Africa, and Argentina are stimulating land settlement in connection with their encouragement of immigration. France and Italy are doing likewise in order to strengthen and develop their African colonies. In Germany, Italy, the Baltic States, and other countries of continental Europe, the reclamation of swamps and cut-over lands is encouraged, and extensive reclamation works are being carried forward in Egypt, the Sudan, Palestine, and various parts of western Asia. Many of the conditions which appear to

justify government promotion of land settlement in the other countries do not apply to the United States. Yet our homestead laws continue to promote the settlement of land unfit for settlement, and since the beginning of the agricultural depression there has been continuous agitation for new irrigation projects. A number of new projects or extensions of projects have been authorized by Congress.

No Scarcity of Farm Land

In this country we are not attempting the settlement of a colonial empire such as northern Africa. Although, like Canada and Australia, we formerly found it desirable to employ our land policy as a means of attracting immigration, we are now endeavoring to restrict immigration. Unlike some of the densely peopled countries of Europe, our output of farm products adapted to the climate is adequate, and we have no scarcity of agricultural land. Although the Federal Government has disposed of practically all the lands of agricultural significance formerly in the public domain, there is still a vast area of potential crop land in private ownership. This area is estimated at more than 600,000,000 acres. A large proportion of this is fair to good land in woodland areas where only clearing is necessary. Such land, as well as large areas of potential crop land in semiarid regions, awaits only a sufficiently stimulating price for farm products to be brought quickly under the plow. In fact, this privately held land exerts at times an unfavorable influence on agricultural prosperity. The owners, affected by the burden of taxes and other carrying charges, are naturally anxious to put it to early use either themselves or by sale to farmers. Temporary increases in farm commodity prices cause some of it to be brought into cultivation, and when prices fall there is no ready contraction in the new farm areas because of the difficulty of transferring the labor and capital put into them to other industries. Short-sighted expansion of the agricultural area in times of temporary prosperity is encouraged, moreover, by the potent influence of supersalesmanship exerted in the interest of land-selling agencies.

Stimulated Expansion Unnecessary

These considerations show that probably it will not be necessary, at least for a long time, to invoke public policy for the stimulation of farm-land expansion in the United States. When farming is sufficiently profitable, there will be plenty of land forthcoming. Much of the needed increase will be made available from the larger areas of cut-over land and semiarid land not requiring extensive reclamation, much of it already within the boundaries of farms. Indeed, experience has shown that when the outlook is sufficiently promising private enterprise can be depended on to reclaim new areas. Far more land in the United States has been reclaimed by private than by public initiative. Although at times private capitalists have shown some hesitancy about investing in reclamation bonds, yet it hardly seems necessary or desirable to employ Federal funds, except under very unusual conditions, to accomplish what private capital will not venture to undertake on account of the doubtful profitableness of the enterprise. There may sometimes be justifi-

cation for Federal participation in enterprises involving, in addition to land reclamation, such matters of national concern as water-power developments, flood protection, or international and interstate relationships. In such cases, however, Federal promotion of agricultural expansion should be incidental to other interests. Where the sole purpose is to provide new farm land, the need for new land should be very clear before the enterprise is undertaken. There is need for a comprehensive study of reclamation policies and of the reclamation projects now under cultivation or contemplated. When the time arrives to expand our agricultural area we will have the facts and know what to do.

The policy of giving settlers on Federal reclamation projects from 20 to upwards of 40 years to repay construction charges without interest constitutes an extensive subsidy to agricultural expansion. This subsidy, moreover, varies directly with the length of time legally allowed for the repayment of the construction costs, which has been several times extended and works a hardship on other farmers. It was estimated in 1923 that on the basis of the terms of repayment of interest then existing, the exemption of interest at 4 per cent amounted to nearly 46 per cent of the cost of construction. Since then the period of repayment has been greatly extended and the subsidy correspondingly increased. As no corresponding subsidy is enjoyed by private enterprise in the development and utilization of agricultural land, the settlers on Government projects are given an important competitive advantage.

Reclamation in South

In recent years it has been proposed to extend the Federal reclamation policy to humid areas of the country, particularly in the Southern States, for the drainage and clearing of land and the restoration of soils. Under this proposal an appropriation has been obtained for exploratory purposes, and a number of projects for reclamation and land settlement have been tentatively selected. This hardly seems a sound policy. A survey of typical drainage districts in the lower Mississippi Valley and the South Atlantic States made in 1926 showed that less than 40 per cent of the drained land in those areas was in cultivation. In some projects but little progress had been made in bringing the land under the plow. Such facts pondered in connection with census statistics showing that the acreage of land in harvested crops east of the Mississippi River decreased 15,569,343 between 1919 and 1924 scarcely support the plea for extending Federal land reclamation in that area. Federal activity in the promotion of farm land expansion seems particularly unwise when we reflect that a number of Federal reclamation projects are suffering seriously from depression aggravated by heavy overhead charges growing out of high costs of construction. On these projects large numbers of farmers have been in serious arrears with their payments. Moreover, the land in them is far from being fully utilized.

In general, proposals to enlist the funds and initiative of the Federal Government in stimulating agricultural expansion must cause concern to all persons interested in the farmer's welfare. With a huge reservoir of potential agricultural land, and strong forces tending constantly to stimulate expansion of the farm area, our land

problem at present is not how to force land under the plow as rapidly as possible but how to achieve a wise and economical allocation of our available land among major uses such as crops, forests, and extensive grazing, and in such a way as to make farming on that land profitable.

Help to Private Enterprise

Since the greater part of the unreserved public domain has been alienated, except the arid portion, our policy should take the form of investigation and helpful direction to private enterprise, supplemented in some measure by Federal and State acquisition of forest lands. There are great areas of cut-over land and semiarid land where the suitable type of use remains to be determined. At present it is largely unused or inadequately used for lack of a definite policy. This is the situation in a large proportion of the cut-over areas of the Appalachian Mountains, the Atlantic Coastal Plain, the Gulf Coastal Plain, the Highland River, the Ozark and Ouachita Uplands, the northern part of the Great Lakes States, and a considerable territory in the Pacific Northwest. Most of this land is in private ownership and its future utilization must depend largely on private enterprise; but the problem of utilization is such that it can not be worked out alone without public action. The determination, for instance, of the economic feasibility of using land for reforestation involves technical questions of silviculture and forest management which are beyond the resources of a large proportion of the landowners in these regions. Moreover, it frequently is bound up with public action to provide fire protection and to modify systems of taxation. When the alternative possibilities of agriculture and extensive grazing are involved, the problem becomes doubly difficult for private initiative to solve. In many parts of these areas it is probable that none of the uses mentioned can be profitably employed by private enterprise, and it is desirable to consider the advantages of establishing State or Federal reserves. A great deal of careful investigation is requisite in order to determine what parts of these great areas can be economically farmed or employed as range land, and by what methods and systems of organization; and what are the economic possibilities of reforestation by private or by public enterprise. This department is making a beginning in the development of such a policy and purposes its extension in cooperation with the States as rapidly as may be possible. I shall refer to these considerations again in discussing the forest situation.

MOVEMENTS OF POPULATION

In the last seven years the farm population of the United States has probably declined more than 3,000,000. In 1920, according to the census, the farm population was about 31,000,000. In 1925 the census showed a reduction to less than 29,000,000. An estimate made of the farm population as of January 1, 1927, put the total at approximately 28,000,000. This loss of farm population is commonly believed to be the result exclusively of unfortunate agricultural conditions engendered by the postwar depression. This is not the case. Undoubtedly the depression of the last few years has accelerated

the loss of population from the country to the town. But the loss is in large measure a product of natural conditions which do not necessarily indicate that agriculture is a declining business, but which are quite compatible with its progress and prosperity. It will help us to distinguish between the permanent and the temporary causes of the decline in farm population if we bear in mind the fact that there was a break in the continuous growth of our farm population as far back as 1910.

In all probability, according to studies made by the department, a decline in the actual numbers of farm population began in certain States as early as 1880. It began in other States in the years following 1890, and in still others as far back as 1900. From 1910 to 1920 a decline took place in a considerable number of States. It is therefore obvious that causes of this condition exist independent of the recent depression. A certain part of the movement is due to natural long-time adjustments between industry and agriculture. It is a normal trend which need not operate to the disadvantage of agriculture.

This normal trend was undoubtedly accelerated by the postwar depression. It is important not to confuse the effects of agricultural distress with the natural consequences of increasing farm efficiency and expanding industry. Conditions that make agriculture temporarily unprofitable inevitably cause an excessive withdrawal from it of capital and men. This is unfortunate not only for agriculture but for the Nation as a whole. It is accompanied by depreciation of farms and buildings. If the process goes too far, it will necessitate correction eventually at heavy expense. For this reason too much reliance should not be placed on the cityward movement of population as a means of restoring agriculture to a satisfactory footing. What is needed is a proper balance between agriculture and other industries, and it is as harmful in the long run to have this balance impaired through excessive loss as through excessive increase of farm population. In all probability one of the earliest signs of returning prosperity in agriculture will be a declining movement of population from the land.

Several factors in the situation, however, have no particular relation to war-time or postwar influences. Among them is the transfer to the city of work formerly done on the farm, as when laborious hand-labor processes are supplanted by machinery produced in factories. Labor saved in agriculture by the use of machinery is offset in part, of course, by the labor used in cities in producing the machinery. It is therefore not wholly lost to agriculture. In general, however, the mechanization of agricultural processes releases from the farm considerably more labor than is required in factories to produce the necessary agricultural equipment. There consequently tends to result a relative loss of country population which does not at all imply that agriculture is declining. As a matter of fact it is a sign of progress when a given economic result can be achieved with fewer workers.

Influence of Science

Another important influence in reducing the number of men necessary in farm work, and therefore in tilting the balance of population

in favor of the cities, is the advance of scientific methods in agriculture. Improved grains, vegetables, fruits, and livestock, improved management of soils, and improved protection against plant and animal diseases have the same effect in economizing labor as is produced by the displacement of labor by machinery. These forces, unless they are offset by a great increase in the demand for agricultural production, must necessarily affect powerfully the ratio between rural and urban population.

There is another factor, however, that we can not regard with equal complacency. When agriculture loses personnel through conditions that make the business unprofitable or through conditions that make country life unattractive, remedies are necessary. Many things that tend to make the farm seem less attractive than the city can be controlled. I have already discussed the necessity of getting for agriculture its proper economic status, its proper share of the national income. Progress in this direction is being made. It is also necessary, however, to develop a fuller and richer rural life, so that where economic reasons do not compel them, competent farmers will feel less temptation to leave the country. It should be possible to make country life so attractive that farmers will not want to leave it even after they become well off. Indifference to rural standards of living, which has injured many countries, is always unwise.

Whether the normal farm population increases or decreases, it is certain that the Nation will suffer if the quality of the population left on farms is lowered. Modern conditions make it more certain that we shall have a sufficient number of farmers than that we shall have farmers of the highest type. As a check upon the loss of intelligent farmers to cities, stress should be placed on the methods of consumption on the farm. Assistance must be extended to rural communities to achieve the highest possible standard of living on the incomes available. A certain percentage of our farm homes are already equipped with labor-saving devices, such as telephones, gas and electric lights, and good plumbing. Better adaptation of such facilities to rural communities would help greatly in increasing their use on the farm.

Need for Cultural Facilities

Much might also be done to provide better cultural opportunities. Farmers want education, recreation, entertainment, health facilities, art in public buildings, and comfort and beauty in their homes. Increased farm incomes are not the only thing necessary to give them command of these things. It is also necessary to improve the technic of rural consumption. Cities have technical experts in many lines to work out the technic of consumption on a high level for the urban population. There is no reason why a similar service should not be done for the farmers. As a matter of fact, the Government has authority to assist in research and educational work directed toward the betterment of rural life. In this work the Department of Agriculture is active. Efforts to equip the country with institutions for health and culture, and facilities for education and entertainment are as thoroughly worth while as the work done to promote farm efficiency and increase farm returns.

THE LOWER MISSISSIPPI FLOOD

A great flood in the lower Mississippi Valley, which did enormous damage in several States, marked the year 1927. Flood conditions really began to develop in August and September, 1926, when heavy rains fell in eastern Kansas and Oklahoma. Later these rains extended into Illinois and Indiana, so that instead of the usual low waters during the fall months in the middle and lower Mississippi Valley the river and many of its tributaries were at abnormally high stages for that time of the year. During the last week of December, extremely heavy rains in Kentucky and Tennessee caused the greatest flood of record in the Cumberland River, and very high waters in the Tennessee River. Many of the tributaries of the Mississippi remained at a high stage during the winter months, and heavy rains during March and April, followed by torrential rainfall from April 9 to 22 in the Arkansas, Red, and lower Mississippi Valleys, resulted in the greatest of all lower Mississippi floods. During the period from December 18, 1926, to April 30, 1927, the rainfall over the Mississippi basin was sufficient to cover the entire area of 1,251,000 square miles contained therein to a depth of 12.38 inches.

The overflow covered 18,269,000 acres, or more than 28,000 square miles, in the States of Illinois, Missouri, Kentucky, Tennessee, Arkansas, Mississippi, and Louisiana. Of this area, nearly 4,500,000 acres were planted to crops in 1926. Of the crop land overflowed, 1,839,000 acres were in Arkansas, 1,112,000 in Louisiana, and 662,000 in Mississippi.

Flood Losses

The lower Mississippi Valley is primarily a farming section, with comparatively few large cities on the lowlands, so that flood losses were mainly agricultural. Definite estimates of flood damage are difficult to compute, as there must be included in the total such items as extra labor and material for strengthening the levees, the destruction of roads and bridges, damage to buildings, equipment, and supplies, the loss of prospective crops, suspension or loss of business on the part of retail and wholesale merchants, loss of livestock, and many others. Estimated livestock losses include 25,000 horses and mules, 50,000 cattle, 150,000 swine, and 1,250,000 poultry. Estimates compiled by the Weather Bureau from many sources indicate a total loss of between $350,000,000 and $400,000,000.

Relief to flood sufferers was extended primarily by the American Red Cross, voluntary relief contributions by the American people amounting to more than $16,000,000. In addition, various governmental agencies, such as the Army, Navy, and Coast Guard, aided in the relief work, contributing tents and supplies, boats for removing people and property from the flooded districts, airplanes for communication, and other service. The Weather Bureau made remarkably accurate predictions of probable flood stages at various points throughout the flod area, thus aiding greatly in the protection and rescue work and the saving of life and property. These predictions were based on many years' experience in estimating floods and accurate records of rainfall and river stages at a large number of points. The American Red Cross not only furnished shelter, food, and medical supplies to a large part of the 600,000 refugees but

supplied many of the farmers with feed for work stock and seed for planting when they returned to their homes.

Extension agents employed cooperatively by the Department of Agriculture and the State colleges of agriculture were extremely helpful in determining needs of farmers, in locating supplies of seed, in making suggestions as to the best crops to grow after the flood waters receded, and in organizing relief work. Home demonstration agents aided in planning the diet of the refugees, in giving instruction in the proper feeding of children and invalids, in instructing the women and girls in remodeling of clothing and refinishing of furniture damaged by the flood, in making provision for sanitation, and in many other ways.

Crop Production on Flooded Lands

The flood began in Missouri and Arkansas before the normal planting time for cotton but did not reach Mississippi and Louisiana until much of the crop was planted and growing. Continued wet weather for several weeks before actual flood waters reached these latter States, however, had greatly delayed planting. More than half of the cultivated land in the flooded area, or about 2,600,000 acres, is normally in cotton, about 1,100,000 acres in corn, 360,000 acres in hay, and 370,000 acres in other crops. Because of delayed planting and reflooding in some sections, it is probable that not more than 3,000,000 acres were planted this year, of which not more than half was in cotton. The necessity for late planting caused a shifting from cotton to corn, so that more than the usual proportion of the land was in corn and forage crops. Late planting and wet weather made the cotton crop especially subject to boll-weevil attack, with resulting unsatisfactory returns.

Fortunately, cotton growers in the lower Mississippi Valley can produce the longer staple cottons which can not be grown on the dry lands of western Texas and Oklahoma. There is a ready market for these long-staple cottons at fairly satisfactory prices, even in years when there is an oversupply of the shorter staples and poorer grades. The necessity for obtaining new stocks of planting seed this year made it possible for many growers to replace the poorer varieties with the better long-staple strains. Seed of these long-staple strains was in abundant supply and was very generally provided by the American Red Cross for farmers who were without seed and unable to obtain it from other sources. Without question the lower Mississippi Valley was planted more uniformly to good varieties of cotton this year than ever before. In much the same way it will be possible during the next few months to replace the less-resistant sugar canes in the flooded area with varieties which are resistant to disease. Stocks of these newer varieties, introduced and distributed by the department, are available in sufficient quantity to replant the flooded acreage, and arrangements have been made to finance their purchase by growers who lost their planting stock in the flood. The department and the State agricultural colleges are giving attention to the expansion of acreage of minor crops which can be produced with profit, and the introduction of new crops and farm enterprises which promise reasonable returns when substituted for cotton and sugar cane.

Credit Problems

The rapid expansion of cotton production in western Texas and Oklahoma in recent years, and the low price of the 1926 crop generally had placed cotton growers in the lower Mississippi Valley in a difficult financial situation before the flood occurred. Mortgage debt had increased materially since 1920 and an unusual proportion of the production credit was carried over from 1926 into 1927. As a result of the relatively large volume of renewals on loans and advances, banks and merchants would have found difficulty in extending normal production credit in 1927 if no flood had occurred. Losses resulting from the flood caused bank deposits to fall, which, together with the large volume of unpaid 1926 credits, reduced the loaning power of local banks to such a point that financing the crop where replanting was possible after flood waters receded became a serious problem even where ample security was available. At the suggestion of the Secretary of Commerce, who was extremely active in relief and rehabilitation work, credit corporations were organized in Arkansas, Mississippi, and Louisiana which aided materially in financing crop production. In areas where successful replanting and production were impracticable in 1927, bankers and merchants will no doubt find extreme difficulty in extending needed credit to farmers for the 1928 crop regardless of available security.

Those in need of credit in 1928 fall into two principal groups: (1) those in position to offer reasonable security; and (2) those who have little or no security except the crop to be produced or the animals and equipment to be purchased with such credit. The needs of the first group may perhaps be met largely through assistance extended by banks, merchants, and credit corporations in the form of loans and rediscounts. A number of credit corporations already exist in the flood area and the formation of additional corporations of this character will no doubt be effected during the next few months. Special consideration will of necessity be given by intermediate credit and Federal reserve banks in the rediscounting of agricultural paper in the affected areas. The reestablishment of normal conditions will necessarily require considerable time and rediscounts should be granted for as long periods as seem reasonably practicable.

For those having inadequate security to offer for loans on a strictly commercial basis, mortgage credit on crops, livestock, and equipment will of necessity be supplied with frank recognition of the possibility of losses. The losses which may result from the extension of generous credit on crop and livestock mortgages will not compare, however, with the losses which would follow failure to render such aid.

Creditors will of necessity exercise a lenient policy with reference to interest payments and obligations which mature before the flooded area can produce a crop in 1928. Where repayment rests on the borrower's opportunity to continue a producer, the interests of both the lender and the borrower will be promoted by such a policy. Where security margins are ample there should be no question about extension of further credit. The rich alluvial lands of the lower Mississippi and its tributaries, if protected from flood danger, have a potential value far beyond the obligations now standing against them. Leniency on the part of money lenders during this period of stress, and the refinancing of many plantations on a long-time amor-

tization basis at a reasonable interest rate will go far toward preventing heavy losses on the part of present owners and a general demoralization of the agriculture of the area.

Flood Prevention

The prevention of serious floods in the future is an agricultural as well as an engineering problem. While the major problem of preventing disastrous floods on the rich agricultural lands of the lower Mississippi River and its tributaries is primarily one to be solved by the engineers, farmers can contribute much to its solution by so handling their lands as to prevent erosion and delay the movement of flood waters. Terracing of all cultivated land except that which is practically level, the growing of winter cover crops, and the maintenance of an abundant supply of vegetable matter in the soil so as to increase its water-holding capacity will greatly reduce run-off and tend to prevent floods. This will not only benefit the people in the river valleys, but will be of even greater benefit to the farmers on the higher lands by preventing loss of soil fertility through erosion. Erosion not only lowers soil fertility, but the gullying of fields reduces the available acreage of cultivated land and pasturage, causes the rainfall to pass more rapidly into the streams, lowers the water table, fills the rivers with silt, and lessens the capacity and shortens the life of storage reservoirs.

In addition to the prevention of erosion on farms, much can be done to lessen the danger from floods by the maintenance of forest cover on steep slopes. Two-fifths of the drainage area of the Mississippi River was originally in forests, about half of which has now been cleared for agriculture. Maintenance of timber on the mountain slopes in the Appalachian, Ozark, and eastern Rocky Mountain highlands, either through public or private control, will aid materially in preventing future floods. Planting of trees on steep slopes on farms will utilize such lands to the best advantage and will materially reduce run-off.

Prevention of future disastrous floods is an imperative national problem. Not only is it necessary to protect some of our richest agricultural lands and the homes and property of hundreds of thousands of people, but, coupled with flood control, consideration must be given to the possibilities of storage, control, and utilization of flood waters to provide cheap water transportation and electric power. In the eastern Rocky Mountain and Great Plains areas a study of the storage of water for possible future use for irrigation is also an essential feature of a comprehensive flood-control plan.

SCIENTIFIC RESEARCH IN AGRICULTURE

It goes without saying that scientific research in the modern world is the basis of economic improvement. Great corporations and business organizations are developing research agencies on a large scale. It is estimated that the annual expenditure of this country for the application of scientific knowledge is about $200,000,000. Of this amount approximately $20,000,000 is expended by State and Federal Governments for the development of agriculture. Most of the balance is expended by industry for the scientific control and develop-

ment of improved processes based on research. In proportion to the total amount spent on research in other fields, therefore, the expenditure for agricultural research is not large. I have repeatedly urged the appropriation of larger amounts for the department's scientific work. This would be an immensely profitable investment. It would pay large dividends, not only to agriculture but to the Nation as a whole.

The department is now expending about $10,500,000 a year for research work. This is inadequate even for the efficient handling of projects already in hand. It is estimated that at least $15,000,000 annually is required to do well what is already being attempted. Important developments in new fields, of course, are impossible without additional resources.

Of the $20,000,000 expended on agricultural research in the United States, about half is contributed by this department and half by the various States. Contributions by the Federal Government to the States for research now amount to $3,360,000 a year. Under the Purnell Act, which went into effect July 1, 1925, these contributions will increase to an annual total of $4,320,000. Money expended by the States and the Federal Government for the application of science to agriculture has yielded large returns. No better proof that expenditure for scientific research is true economy could be desired than that furnished by recent developments in agriculture.

Results from Dairy Research

This department, for example, has taken a leading part in dairy investigations that have resulted in better milk, in the reduction of losses from spoilage, and in promotion of increased milk consumption. This work has been done by the department and the experiment stations at an estimated total cost, as far as the department is concerned, of $72,000. It is saving the dairy industry millions of dollars a year. Altogether, the department spends annually a little over $500,000 for dairy research. Savings made possible in one group of projects in this field are immensely greater than the entire cost of all the work done in dairy investigations by the department. In the department's Bureau of Animal Industry 23 research projects have been completed at a cost of $50,900. Knowledge resulting from these projects is repaying their cost many times over.

An Investment Opportunity

Opportunities open to the Nation for profitable investment in agricultural research are countless. Diseases and insect pests, for example, destroy annually about 20 per cent of our possible crop yields. Much of this loss could be prevented at a comparatively small cost. Other means of reducing costs in agricultural production through scientific discovery only await the provision of adequate funds to become available. It is therefore a hopeful augury that a good start has been made under the Purnell Act, which provides more funds for research by the State experiment stations. Under this act, though not required to do so, nearly all of the States provide, in addition to buildings, grounds, and equipment, appropriations equal to or greater than the Federal allotment, and the work undertaken is

carefully correlated by a joint committee representing the Department of Agriculture and the experiment stations. Special provision is made for research in agricultural economics, home economics, and rural sociology.

In the Department of Agriculture during the last year important changes have been effected in organization, in pursuance of a general policy to segregate research work from the work of law enforcement, whenever feasible to do so, and to provide the fullest opportunity for carrying on these activities with greater economy and efficiency by placing them in separate administrative units. Since cases of law enforcement must receive prompt attention, there is a natural tendency to give them precedence over less urgent though fundamentally important research work when both types of work are conducted by the same organization.

Department Units Merged

Accordingly all research work formerly conducted by the Bureau of Chemistry, the Bureau of Soils, and the Fixed Nitrogen Research Laboratory has been consolidated in one research unit designated the Bureau of Chemistry and Soils. Law enforcement work formerly conducted in the Bureau of Chemistry and by the Insecticide and Fungicide Board has likewise been consolidated in a single administrative unit designated the Food, Drug, and Insecticide Administration. This unit is charged with the enforcement of the Federal food and drugs act, the tea inspection act, the insecticide and fungicide act, the naval stores act, the import milk act, and the caustic poison act.

The unit heretofore designated as the Packers and Stockyards Administration has been merged with the Bureau of Animal Industry in order to harmonize the enforcement of the packers and stockyards act with the other regulatory work affecting livestock and to provide for better and more extensive cooperation and that intimate coordination of work that is best secured when the immediate administrative authority is vested in one executive.

These changes should facilitate the study of problems urgently demanding solution, such as the better industrial utilization of farm products, the utilization of farm wastes, the more effective control of disease and plant pests, the study of potential foreign pests and diseases with a view to preventing their entry into the United States, and the improvement of methods of crop cultivation.

One of the difficulties faced by the department in its effort to improve its research activities is the fact that commercial, industrial, and educational organizations offer better inducements to qualified research men than the Federal Government. Whatever the present law permits has been done to obtain and hold research men with the necessary qualifications. It has not been possible, however, to accomplish this object as fully as is desirable. It would seem that, if the scientific work of the department is to be placed upon the most efficient basis possible, the Secretary should be given more latitude to establish the type of organization and the positions necessary. In commercial work the salaries are from 50 to 100 per cent higher than in the Government service, and they are from 25 to 50 per cent higher in the better college positions.

The Government should at least be in a position to hold its own with the universities and the research foundations.

Entire Public Benefited

In urging better provision for agricultural research, I want to emphasize the fact that its benefits go to the entire public and not merely to the farmers. There is a mistaken impression that the Department of Agriculture is operated for the sole benefit of the agricultural industry. As a matter of fact, a large part of the work done by the department and a large part of the funds expended by it are devoted to the promotion of the health, prosperity, and well-being of the general public. Even expenditures that seem to be primarily for the benefit of the farmer usually result in benefits also to the whole population. This is obviously true of research activities which enable farmers to produce better crops and livestock, to reduce their production costs, and to market their products in a more orderly and efficient manner. Savings effected by such activities benefit consumers as well as producers. It is true of all the department's work, and particularly of its research work, that the ultimate beneficiary is the entire community.

It will be convenient at this point to notice a few examples of the way in which the department's work promotes the general welfare as well as that of agriculture. The largest item of money expended by the department is for the improvement of roads. Over $92,000,000, or 60 per cent of the total expenditure of about $153,000,000 which was charged to the Department of Agriculture during the fiscal year 1927, was spent for this purpose. Improved roads benefit alike the city dweller and the farmer, and, since the city population is greater than the population of the farms, the improved roads probably contribute to the cities a sum total of benefits that exceeds the benefits derived by the farmers. No factor is as important as highway improvement in reducing the cost of operating motor vehicles, and certainly nothing contributes more to the utility and pleasure derived from the automobile. Besides contributing nearly $83,000,000 for the fiscal year 1927 to the several States as Federal aid in road construction, the department expended directly about $9,000,000 on forest roads and trails. These forest roads and trails facilitate fire protection in the national forests, improve communication between towns located within and adjacent to the forests, and form essential links in interstate and transcontinental roads on which traffic would be seriously impeded were it not for the contribution and work of the Federal Government. Engineering studies made by the department are reducing road maintenance costs for the States, counties, and municipalities, as well as for the Federal Government, and therefore contribute materially to lightened tax burdens.

Tax Burdens Lightened

Besides contributing nearly $83,000,000 in the fiscal year 1927 to the several States as Federal aid in road construction, the department expended directly about $9,000,000 on forest roads and trails. These forest roads and trails facilitate fire protection in the national forests and carry a large tourist traffic in the national forests and national parks. Engineering studies made by the department are

reducing road-maintenance costs for States, counties, and municipalities, as well as for the Federal Government, and therefore contributing materially to lightened tax burdens.

Another example of work done by the department for the benefit of the general public is the Federal meat-inspection service. Two thousand inspectors, at an annual cost of more than $5,000,000, stand guard at stockyards and meat-packing establishments to see that livestock and meat-food products entering into interstate commerce are wholesome and fit for the table. In like manner, the enforcement of the food and drugs act, better known as the pure food law, protects the public against unwholesome or adulterated food and drugs. This work calls for an expenditure of nearly $1,000,000 annually. Under other appropriations the department examines tea entering the country, and passes, also, on the quality and effectiveness of disinfectants and insecticides. Under a new law passed at the last session of Congress, the caustic poison act, the department will be required to see that householders are protected by proper labels and warnings from the misuse of caustic poisons.

Importance of Tuberculosis Eradication

About $6,000,000 a year is now being expended by the department in cooperation with the States in a campaign to eradicate bovine tuberculosis. This campaign has materially reduced tuberculosis in cattle, resulting in more economical production and safer meat and milk. Through its Bureau of Home Economics, the department has been spending something like $100,000 a year in investigating foods and nutrition, household appliances, textiles and clothing, and household finances.

Weather Service

Everyone is familiar with the local weather forecasts made and published daily by the department's Weather Bureau. Few people appreciate, however, the far-reaching scope and importance of the work of this bureau. The department's weather forecasts often effect important commercial savings. Last year, for example, a building contractor reported saving $36,000 on one cement job by heeding a local frost forecast. Daily forecasts and special frost warnings for agriculture save large sums annually to fruit growers. Flood warnings are often of extreme economic importance, and in recent years a special service for aviation has been maintained by the depatrment. Transatlantic aviation this year was facilitated by weather service furnished by the Weather Bureau in cooperation with British, French, German, and Brazilian national meteorological offices. Officials of the Weather Bureau are preparing to organize a standard weather service to meet such needs.

The expenditures of the Forest Service last year aggregated approximately $24,000,000. Eliminating about $9,000,000 for forest roads and trail construction and $3,000,000 from national-forest receipts paid to States for county road and school purposes, practically all of the remaining $12,000,000 was applied to the administration, protection, and development of the national forests. While benefits from these activities have accrued to farmers through the protection of watersheds providing water for irrigation, through

free use or sale at cost of timber, through free grazing for milk and work animals, and, in other ways, this program of forest conservation and utilization has been of direct benefit to the public as a whole. Less than $75,000, or only a fraction of 1 per cent of the total appropriations of the Forest Service, have been expended exclusively for farmers, this amount being used cooperatively with the States to provide planting stock for windbreaks, shelter belts, and farm wood lots.

Expenditures Relatively Small

It is worth noting that the amount expended by the department during recent years for all purposes, including road construction, has been less than 4 per cent of the total annual expenditures of the Federal Government. The total expenditure of the department for the fiscal year 1927 was $153,000,000, including $92,000,000 for roads. Of the remaining $61,000,000, the sum of $8,760,000 was paid directly to the States under the Hatch, Adams, Purnell, Smith-Lever, and supplemental acts, for the support of research work at State agricultural experiment stations, and for agricultural extension work in cooperation with States, counties, and farm organizations. About $1,900,000 was disbursed for the acquisition of additional forest lands, and in forest-fire protection in cooperation with the States. Another fund, totaling about $3,300,000, consisted of payments to the States in the form of special road and school funds, and represented a part of the receipts collected from timber sales and grazing fees in the national forests. There remained approximately $47,000,000 as expenditures for what might be termed the ordinary activities of the department, in which category are included all of its research work and such services as the administration and protection of the national forests, the enforcement of regulatory laws, the eradication or control of plant and livestock diseases and insect pests, crop and livestock estimating, market news services, shipping-point and terminal market inspection service, and the maintenance of big game and bird refuges. A detailed analysis of the department's expenditures will be found at the end of this report, and a glance at this analysis will reinforce what I have said as to the wide distribution of the benefits accruing from the department's work.

ECONOMIC RESEARCH AND MARKETING SERVICES

Demand for facts on production and marketing of farm products continues to increase. The fact-gathering, production, and marketing-service divisions of the department are being taxed to supply the information asked for. Progress has been made in gathering the facts of production, market movements, and prices. A plan for decentralizing the crop and livestock estimating service has been adopted whereby much more of the primary data collected from farmers and others relating to acreage of crops, numbers of livestock, etc., will be gathered hereafter by the 39 field offices of the service. This will not include what are commonly called the "speculative" crops, namely, cotton, wheat, corn, and oats, except in the minor States. The decentralization has resulted in a material reduc-

tion in the clerical staff of the Washington office and a saving of time.

Changes in demand for farm products and the competition of new production areas have forced farmers to reorganize their work. Through studies and surveys of farm management and economic conditions the department has developed facts to aid farmers in making shifts in types of farming. For example, a detailed study of the agriculture of Idaho was made in cooperation with the Idaho Agricultural Experiment Station and other agencies. This called attention to an increasing demand for dairy products in far-western markets within shipping distance of Idaho producers, and aided them in expanding operations into the most profitable lines. Similar studies were conducted in areas near Billings, Montana, and in South Carolina.

The disastrous downward plunge of cotton prices last fall moved the department to begin a program of economic research to meet future needs. Congress provided some additional legislation to carry it forward. Through fundamental studies of demand it is hoped to determine the extent of uses for cotton at any given price. The plan also calls for classification of cotton by grades as well as by bales. New and extended uses of cotton will be explored. The demand for cotton is more than normally flexible. The aim should be a supply at a price which normally should compensate the grower.

Through studies of supply it is hoped to determine the actual production of cotton in terms of grade, staple, and character, and to determine the variation of the production from the world's requirements. Work has started in Georgia and in 27 counties in western Texas and southwestern Oklahoma. It is planned to follow another year with periodical estimates of grade and staple of all cotton ginned and an estimate of the carry-over as of August 1.

Technological studies of spinning utility will continue. Additional studies will be made of the characteristics of the fibers which give them utility and strength. A series of studies of the cotton markets is also under way. From these and related studies it is hoped that a body of facts may be developed which will suggest many improvements in cotton production and marketing.

A study of the apple industry started during the year, in cooperation with several State experiment stations and the Extension Service, gathered statistics of the ages and varieties of trees in commercial orchards in all the important apple regions. Analysis will indicate the trend of production in each section during the next 10 or 15 years. The department made studies of prices received by growers for different varieties, sizes, and grades, and collected information on the supply and demand in representative cities. All the information will be interpreted and presented to enable producers better to adapt production to the market.

The research work of the Division of Agricultural Cooperation has been well organized and is beginning to show helpful results. Two outstanding studies completed this year deserve mention. A survey of the prune industry of Oregon and Washington, undertaken at the request of cooperative associations marketing prunes and of other organizations, covered the markets and methods of distribution, factors affecting production, and the present and probable future

output of the product. The study now forms a basis for the development of a selling campaign.

This division also surveyed the economic factors a ecting the production and marketing of milk in New England, at the request of 25 dairy cooperatives. The report pictures the principal economic conditions which face this industry. Other studies of cooperative marketing completed during the year are: A survey of the Canadian wheat pools; a study of the livestock cooperative associations; a survey of the marketing of deciduous fruits of California; a business analysis of the marketing of Pacific coast eggs; and a study of membership relations in cooperative associations.

In February a meeting of representatives of 29 leading wool-marketing associations, representing approximately 38,000 wool producers who market 30,000,000 pounds of wool, was called under the provisions of the cooperative marketing act. Following this conference, a representative of the department went to Australia and New Zealand to survey and analyze methods of wool marketing and to gather information applicable to cooperative marketing in this country.

Information service on foreign competition has been strengthened by the appointment of a representative of the department to the Orient, where he has made a survey of present and probable demands for American farm products in the Far East. That part of the world taken more and more of our wheat and other products.

Development of standards for farm products has continued. At the Pan American Standardization Conference in Washington last May, attended by representatives of most of the Pan American countries, the department made a special display of its work in standardization. Representatives of tht European cotton exchanges met in March and approved copies of the universal standards for American cotton. Sets of the universal standards were prepared and distributed.

Official standards for dressed beef and for wool top were promulgated. Permissive standards were issued for such diversified products as slaughter vealers, honey, and bunched shallots. Tentative standards for 19 different types of tobacco were placed in use. In connection with the administration of the United States warehouse act work was begun on tentative standards for canned foods.

The Meat Grading and Stamping Experiment

The Better Beef Association, formed through the efforts of several cattle breeders for the purpose of popularizing the higher grades of beef, proposed a class or grade stamp for a carcass or wholesale cut. The packers and the National Livestock and Meat Board cooperated. In May official beef graders began stamping prime and choice grade beef.

The service, started experimentally in nine cities, is now and is wholly on a permissive or request basis. Although the stamping is limited to the two upper grades—choice and prime—a total of 25,493 carcasses, approximating 14,021,000 pounds of beef, were graded and stamped to October 15, 1927. The experiment has revealed the possibilities of bringing quality of meat to the attention of consumers.

Inspection Services Grow

The inspection of fruits and vegetables at both receiving and shipping points increased. Offices in 40 cities provided receiving-point inspection. Inspectors passed on 32,794 cars of fruits and vegetables at receiving points and more than 8,000,000 pounds of fruits and vegetables and other foodstuffs were inspected for steamship lines. The fifth year of shipping-point inspection service continues to prove this service of benefit both to producers and shippers; it furnishes an unbiased report on the quality and condition of products, facilitates marketing, and safeguards their interests in cases of damage or disputes.

The Produce Agency Act

The Sixty-ninth Congress passed an act to prevent the destruction or dumping without good and sufficient cause of farm produce received in interstate commerce by commission merchants and others.

The regulations promulgated under this act designate two classes of inspectors who are authorized to issue certificates of "good and sufficient reason" under the act—(1) any authorized inspector of the United States Department of Agriculture under the farm products inspection law; and (2) any health officer or food inspector of any State, county, parish, city, or municipality.

Although this act went into effect on July 1, no funds were provided for enforcement. Many commission merchants, however, availed themselves of the inspection provisions by calling upon the fruit and vegetable inspectors to certify to the condition of worthless products.

Clearing Houses for Marketing Fruits

During 1926 in the Walla Walla-Milton-Freewater prune district there was started what is known as the "Walla Walla plan," which included the operation of a clearing house of market information for the prune growers and shippers. The shippers of nearly 95 per cent of the output each day advised the market news service representative stationed in the district of their quotation, sales, primary destination of shipments, diverted cars, rejections and allowances, cancellations of orders, etc. He then compiled this information and issued it in the form of a consolidated report to all of the cooperators. This daily exchange of information through an official agency tended to stabilize the market, create a feeling of mutual confidence among the shippers, improve distribution, and prevent the overloading of any of the consuming centers. A clearing house for California grapes, organized this season, was operated on similar lines.

Progress continued under the United States warehouse act, now in its eleventh year. Warehouses for tobacco, grain, wool, dried fruits, and, more recently, canned foods, are the principal warehouses registered under the law. Licensed tobacco warehouses have a capacity of over 500,000,000 pounds; wool about 28,000,000 pounds; grain, 36,000,000 bushels; and dried fruits about 8,000,000 hundredweight.

Market Price Analysis

In an effort to discover the influences of various factors in causing price changes of farm products, research has continued with respect to grains, cotton, livestock, and other products. The results of several such studies have been published and others are being completed. This type of research is helpful in outlining programs of production, so that farmers may be able to adjust production to probable demand. It is desirable to know more about the influences affecting markets, but these can be studied only by using statistics of the past. One objective has been to collect basic statistics running as far back as they were available, and to publish them in a form available to many workers. During the year a series of statistical bulletins has been completed. This type of research is necessarily slow, and must be continued over a period of years to be helpful, but the beginning has been made.

PLANT INDUSTRY INVESTIGATIONS

In my report for 1926 I referred to the department's studies on imported alfalfa and red-clover seed and to a recent amendment to the seed act based on information thus obtained. During the past year these studies have been continued. As a result of hearings held, an order was issued effective June 2, 1927, that alfalfa seed from Argentina should be stained 10 per cent orange red. The aggregate acreage in alfalfa in the area of the United States lying east of the Minnesota-Dakota line and north of the Tennessee-Kentucky line in 1924 was 2,400,000 acres. This territory imports alfalfa seed. Tests have shown that the Argentine seed would have been successful on only a small percentage of this acreage. In many cases the South African and Argentine alfalfas have been killed out completely the first winter, while hardy varieties have suffered no loss.

In the three years, 1924 to 1926, the acreage in the important alfalfa-producing sections of Kansas and Nebraska has declined by a little more than 9 per cent. Two factors appear to be involved—the use of unadapted seed and a newly recognized disease known as wilt. The exact share of each, or of factors at present unknown, in the dying out of alfalfa fields, is not yet clear. It seems certain, however, that a large part of the trouble has been due to the use of seed low in price but unadapted.

Red-Clover Seed Studies

No new staining orders have been issued during the past year covering red-clover seed. Field studies are under way to determine how far the regulations already in force meet the situation. Red clover is the most important legume in the northeastern United States. It is seeded, alone or with timothy, on more than 24,000,000 acres. In part of this area winter hardiness is of first importance. Where the winters are less severe, resistance to certain diseases is the controlling factor in securing and maintaining a stand.

During the past year studies have been under way to determine more nearly the adaptability of foreign seed. Work has also been started on domestic red-clover seed. The differences between red-

clover seed produced in various parts of North America are not so marked as in the case of alfalfa. Such differences exist, however. Canadian and Oregon seed, for example, have usually produced plants more susceptible to anthracnose than plants from Ohio seed, and the plants from Oregon and have commonly been less winter-hardy. It has been determined that strains long grown in one section may develop characteristic qualities either of winter hardiness or of disease resistance. But to place our knowledge of this subject on an experimental basis will take time.

Soy Beans

During the past year many new varieties of soy beans have been received from our agricultural explorers. Owing to the great variability of the soy bean and the marked capacity of different varieties for adaptation to new conditions, the receipt of these new varieties, which include a number from Manchuria, promises to be of great importance. The adaptability of the soy bean to new conditions is well illustrated by the Virginia variety. In the Ozark region of Missouri extensive tests failed to show any promising sorts till the Virginia was tried and found to succeed admirably on the less fertile Ozark soils. The range of local adaptability is extensive and the study of varieties must be carried on over a wide territory.

Cereals

The improved hard red winter wheat, Kanred, developed in cooperative experiments at the Kansas Agricultural Experiment Station, has replaced much of the former acreage of Turkey and Kharkof, particularly in Nebraska, Kansas, and Oklahoma. Kanred is resistant to stem rust, which in some years seriously reduces yields in parts of the hard winter wheat area. Over 4,000,000 acres of Kanred are now grown annually. Newturk, an awnless hard red winter variety developed in cooperative experiments in Montana, was increased for distribution in 1927.

Because of its susceptibility to stem rust, yields of Marquis, the most widely grown variety of hard red spring wheat, are often greatly reduced when this disease is epidemic. Kota, introduced from Russia by the department; Ceres, produced at the North Dakota Agricultural Experiment Station; and Marquillo, a new rust-resistant variety developed in cooperative experiments at the Minnesota Agricultural Experiment Station, are varieties adapted to the areas where rust losses are severe. Reliance, a hard red spring variety developed by the Department of Agriculture, is promising where rust is not serious. This latter variety was distributed for commercial growing in 1926 and 1927.

Bunt or Stinking Smut

Bunt or stinking smut is the most serious disease of wheat in the Pacific Northwest, where soil infestation makes complete control by seed treatment impossible. A red winter variety, Ridit, which is highly resistant to bunt, has been developed in the cooperative breeding experiments at the Washington Agricultural Experiment Station. Some 200,000 acres of Ridit were grown in 1927. Albit, a

bunt-resistant, white club variety, very similar in other respects to the important commercial variety, Hybrid 128, will be distributed to growers in Washington in the fall of 1927. Two productive, bunt-resistant strains, Oro and Regal, have been isolated from the Turkey variety in cooperative experiments with the Oregon Agricultural Experiment Station. About 300 bushels of the latter strain were distributed to farmers in the fall of 1926.

The rosette and flag-smut diseases of wheat were discovered in southern Illinois in 1919. Flag smut is especially serious in other countries where it occurs. Extensive experiments discovered wheat varieties which are highly resistant to or immune from either or both of these diseases and which are well adapted to the area where the diseases occurred. The Shepherd variety, developed by the department, is immune from both. This and other resistant or immune varieties are now so generally grown that these diseases are no longer a serious menace in the eastern United States, and field experiments with the diseases were brought to a close with the end of the 1926 season.

Cotton Improvement

The Acala variety is a new and superior type of upland cotton, first discovered in southern Mexico in 1906 in the course of explorations and experiments conducted by the department in Central America. The new cotton was acclimatized and tested in Texas, and found to be adapted to a wide range of conditions in the United States. It is one of the earliest and most prolific varieties of upland cotton, and produces better and longer fiber than other large-bolled varieties.

On account of its ability to produce good crops in short periods, the Acala cotton is suited to weevil-infested regions, as well as to short seasons along the northern limits of cotton production. Its upright growing habit is an advantage over the more spreading habit of the Texas big-boll varieties. This characteristic makes it easier for the grower to keep open lanes between the rows, so that fallen squares are dried by the hot sun, which kills the weevil larvae. Also, the cotton is easier to pick and fewer bolls are rotted by lying on the ground.

The fiber is of superior quality and length, attaining $1\frac{3}{16}$ inches under favorable conditions. Premiums ranging from 2 to 10 cents per pound are obtained for Acala cotton in communities that restrict themselves to the growing of this variety. In the Coachella Valley of southern California organized community production of the Acala cotton has been maintained since 1920. Several other valleys have since adopted the community plan and are growing Acala cotton exclusively.

Potatoes

Potatoes make a very large and important contribution to the food supply of the Nation. No other food crop, so widely and extensively used, passes directly from the producer to the consumer without fabrication. Potatoes are grown more universally and over a wider area of the country than any other vegetable crop. In certain regions where favorable growing conditions for a period long enough to

produce a marketable crop are the rule, an extensive commercial industry has developed based on seed potatoes produced in regions more adapted to their production.

Because of the large commerce in seed potatoes for use in those areas in which early potatoes are produced, special attention has been given by the department to the production of the varieties that give the best yields and sell for the best prices when grown in the southern growing regions. In the seed-potato-growing areas of the North, emphasis has been placed on the selection of high-yielding strains for seed stock to be sent to the South for the production of the early crop. It has been demonstrated, too, that seed potatoes grown in particular regions give better results under southern conditions than seed potatoes from other areas. As a result, the growers in particular regions in the Southern States arrange for their supply of seed potatoes from these particular regions. Seed-potato fields are carefully inspected while growing to detect and eliminate any plants infected with tuber-borne diseases.

Some years ago the Department of Agriculture tried to develop American potato varieties resistant to late blight, to which they are all more or less subject, by introducing, for breeding purposes, certain European varieties in which blight resistance was well developed. Various virus diseases attacked the seedlings produced in this experiment, making it necessary to devise ways of controlling virus diseases before these new seedlings could be developed sufficiently to carry out regional tests of their adaptability. This experience indicated resistance to these diseases is more important than resistance to blight. The greater problem will be to combine resistance to one or more of these diseases with resistance to blight, scab, and other parasitic diseases, and with regional adaptability.

Tomatoes

The department's horticultural work with tomatoes has been directed toward emphasizing the character and color of tomatoes especially adapted to canning and catsup making, and toward the development of pure strains of these sorts. The importance of the first-generation hybrid as a means of securing optimum yields of tomatoes under limited field culture and in greenhouses has been demonstrated. The selection of high-yielding strains of tomatoes, especially adapted for canning, is still in progress. Important advances have been made which promise to be of value to the canning industry.

The outstanding accomplishment to the credit of the department in connection with the tomato industry is the production of excellent varieties such as Marglobe and others which have proved so resistant to wilt, nailhead rust, and kindred troublesome diseases. Approximately 6,000 cars of Marglobe tomatoes were shipped from a single county in Florida in the winter of 1926–27. The Marglobe is also being adopted in other trucking areas and in the canning regions as rapidly as the seed supply will permit. Six other varieties of tomatoes, viz, Marvana, Marvelosa, Marvel, Norton, Columbia, and Norduke, developed by the department, are now in commercial use. These varieties are not only highly resistant to Fusarium wilt but also possess some resistance to Septoria leaf spot, early blight, leaf

mold, and nailhead rust. Moreover, their fruits are somewhat resistant to puffiness—a condition that causes considerable loss in Florida and other Gulf States as well as in Mexico.

Plant Disease Control

The three campaigns carried on by the Bureau of Plant Industry in cooperation with the States concerned, namely, citrus-canker eradication, blister-rust control, and barberry eradication to control stem rust of wheat, have made satisfactory progress during the past year.

In citrus-canker eradication, Florida reported the discovery of two infected orange trees in December, 1926, the first new infection reported in that State since March, 1925, indicating that the disease is well under control. Mississippi and Alabama are apparently free from canker, as no infections have been found in those States for several years. Louisiana has not reported any new infections, but a number of properties in that State are still classed as "infectious." In Texas the work is being concentrated in the southern part of the State, where heavily infected trifoliata hedges of long standing have been removed, with the result that conditions in that State are now better than at any time since the beginning of the campaign in 1915.

In white-pine blister rust control, scouting during the last year in the Northwestern States showed no further southward extension of the disease, but a marked increase in the amount of pine infection was found in the Olympic Peninsula, Wash., and near Nelson, British Columbia, indicating the certainty of a further extension of the infected area in the course of time. Invasion of the western white-pine forests of the Inland Empire and the sugar-pine forests of Oregon and California is delayed through the maintenance of quarantines and the eradication of the European or cultivated black currants. This plant has been eradicated in Montana and Oregon, almost completely eradicated in Idaho and Washington, and in California it has been eradicated from about half of the State. In the Eastern States the prompt application of control measures has progressed steadily, resulting in the protection of the white pines on 4,032,474 acres of land since 1922. The eradication of black currants and gooseberries in eastern white-pine forests is now progressing at the rate of over 800,000 acres a year.

In the nine years that the barberry-eradication campaign has been in progress more than 14,300,000 plants of common barberry have been destroyed in order to reduce stem-rust losses of wheat and other small grains. In the eastern States of the eradication area positive control of local epidemics of stem rust has followed the removal of these bushes, and in the spring-wheat States eradication reduced materially the losses from destructive epidemics.

Improvement of Sugar-Bearing Plants

The improvement of sugar cane and sugar beets with respect to high yield, hardiness, disease resistance, sugar content, and regional adaptability is an outstanding example of the amelioration of cultivated plants through scientific research. Unconscious selection of superior varieties has been going on for centuries, and planned work

along these lines also dates back for many generations. Early in the nineteenth century attention was focused on the improvement of sugar beets by mass selection. In recent years endeavors have been made to improve both sugar beets and sugar cane by the application of more refined methods resulting from a greater knowledge of the laws of heredity. In the improvement of sugar plants through breeding, increased sucrose content, increased tonnage per acre, resistance to disease, and earliness are among the qualities that have been kept in mind.

Preliminary results are promising. Sugar-cane varieties imported and tested by the department have almost completely supplanted the varieties formerly grown in Louisiana, some of which had been in continuous cultivation for a century or more. The most prominent desirable character of the new varieties is their resistance to disease. Incidentally, some of the disease-resistant varieties also mature earlier, are more tolerant of cold, and ratoon over a longer period. They are also prolific.

Several strains of sugar beets superior to those obtainable from commercial sources have been produced by departmental experiments. To make these strains available to American beet farmers it is necessary to cheapen seed production so that American producers can compete with Europeans, who now have a monopoly. A method involving the overwintering of the stecklings in the field has been developed, which gives great promise of producing seed at less than half the cost required in biennial seed production.

ANIMAL INDUSTRY

Conditions surrounding the production of domestic livestock, including poultry, are gradually being improved by a more effective control of diseases and parasites and by new discoveries in the field of animal husbandry. Noteworthy advances have been made in the last year in several lines of research having a practical application in livestock production. Satisfactory compliance with laws and regulations for the protection and promotion of the industry prevailed generally.

Foreign Maladies Excluded

Quarantine measures against foot-and-mouth disease proved effective during the year. This foreign livestock malady continues to be a serious national menace, however, and has demanded continued vigilance.

A report prepared by the department's foot-and-mouth disease commission, after investigations of the situation in foreign countries, confirmed the value of the quarantine-and-slaughter policy practiced by the United States in stamping out foot-and-mouth disease. Investigations by the commission showed also the extreme infectiousness of the virus. The utmost cooperation by all branches of Federal, State, and local governments is earnestly requested in excluding and combating foot-and-mouth disease.

European fowl pest, which gained temporary access to the United States in 1924 and was suppressed in 1925, has not recurred, though on several occasions the department's inspectors have investigated

reported outbreaks. In all cases the cause for anxiety proved to be a less serious malady than European fowl pest.

Besides maintaining the quarantine regulations previously in force, the department extended its veterinary supervision over imports. The inspection of scrap bagging is now included. Research has been undertaken to determine the effectiveness of various methods for sterilizing commodities that may carry infection. For instance, steam under pressure was found to penetrate loosely packed bales of bagging readily, but, on the other hand, bales of similar material packed tightly by powerful hydraulic machines, to obtain lowest shipping rates, resisted the penetration of steam heat for several hours. These investigations, besides helping to safeguard the livestock industry, illustrate the importance of technical research in connection with the enforcement of livestock sanitary regulations.

Progress in Eradicating Tuberculosis

During the year the cooperative campaign conducted by State, local, and Federal authorities to eradicate tuberculosis from domestic animals made exceptional progress. The Federal appropriation of $4,653,000 for this work was supplemented by still greater support from other sources. The combined State appropriations amounted to approximately $13,000,000, and numerous agencies interested in the suppression of tuberculosis among animals gave additional assistance in workers and funds. Public sentiment has supported this work so admirably that opposition has become largely of local and transitory nature. The available funds and favorable public attitude toward tuberculosis eradication made possible a large gain in the number of cattle tested, the number being in excess of 9,700,000. This was about 7 per cent more cattle than were tested during the preceding year.

Tuberculosis in Swine and Poultry

The suppression of tuberculosis among swine and fowls also received attention during the year. Since hogs are susceptible to the avian type of the disease, the successful development and use of a simple tattoo system of marking hogs facilitates this work among both swine and fowls. In conjunction with post-mortem reports on swine, the tattoo system is useful in identifying sources of swine and avian infection, particularly in areas nearly free from tuberculosis.

Among fowls, tuberculosis varies greatly in its prevalence in various parts of the country. Results of the year's work indicate that the disease among fowls can be detected only partially by physical examination and that, as in the case of the bovine form, the tuberculin test is needed to detect all diseased birds in a flock. The poultry industry is alert to the need for effective eradication methods and is cooperating with the department to that end.

Discovery Concerning Tuberculin

A fruitful field of research during the year was that of interrelated chemical and biological problems. Department investigators in this field made valuable contributions to knowledge concerning tuberculin,

the diagnostic agent used in tuberculosis-eradication work. The investigations disclosed two biologically active principles. The discovery is highly important in its bearing on methods of preparing and testing tuberculin, and promises to result in a more uniform quality of the product.

Tick Eradication

In the Southern States the eradiation of cattle ticks continues to make steady progress. During the year there was a gain of 12 counties and parts of 5 counties in the area released from Federal quarantine. The progress occurred principally in Texas, Arkansas, Virginia, and Florida. Of 985 counties in various Southern States that were quarantined when systematic tick eradication began in 1906, 248 still remained under quarantine at the end of the fiscal year. This important work may therefore be considered about three-fourths completed.

In spite of the excellent progress made there is still some misguided opposition, largely in areas that would derive handsome benefits from the suppression of this pest. Tick eradication is primarily an economic undertaking and the funds invested in it are ultimately returned to a community, with dividends, in the form of a prosperous livestock industry. Packing establishments, creameries, milk condenseries, and ice-cream factories have appeared in regions freed of the ticks. Such establishments provide good cash markets for meat and dairy products besides enabling the communities to be more self-supporting with respect to these commodities.

The floods occurring in the Mississippi Valley during the year aided tick-eradication work somewhat by depositing silt over large areas formerly infested, thus destroying the ticks in enormous numbers. Particularly in Louisiana the flood waters advanced the eradication of the pest. When restocked with tick-free cattle such areas should remain free from these parasites. The department's inspectors accordingly have urged that advantage be taken of this special opportunity to advance the completion of tick-eradication work in flooded areas. In such cases the expense of supervising restocking with tick-free cattle is but a small portion of the cost when an adequate number of dipping vats must be built and maintained to conduct the work in the customary manner.

Federal Meat Inspection

The Federal meat-inspection service continued to operate under the law providing for Federal supervision over meats prepared in establishments doing an interstate or foreign business. Inspection extended during the year to more than 70,000,000 animals, an increase of about 4 per cent over the preceding year. Conditions in the 863 packing establishments operating under Federal inspection were maintained on a high plane of sanitation, and there was general compliance with the letter and spirit of the meat-inspection law. Although the Federal meat-inspection service is operated very economically—about 6 cents for the average animal and all of its products—available funds were insufficient to meet growing demands for the service. It was necessary during the year for the department to refuse numerous requests for the inauguration of inspection.

Hog-Cholera Outbreaks Checked

The department has continued to supervise the manufacture of veterinary biological products produced for sale in interstate or foreign commerce. This activity is conducted under the virus-serum-toxin act of 1913, and includes also the issuance of licenses, permits, and certificates for manufacture, importations, and exportations. A record output of anti-hog-cholera serum occurred during the year just closed, being a result of the unusual prevalence of hog cholera in the fall and winter of 1926. Licensed establishments produced more than a billion cubic centimeters of the protective serum, or about 50 per cent more than in any former year. The quantity of hog-cholera virus was in corresponding proportion.

It is gratifying to report that outbreaks of the disease declined rapidly following the wirespread use of the preventive-serum treatment. This method of immunization, developed in the Bureau of Animal Industry, has been a dependable means of preventing and controlling hog cholera; and the experience of the year just closed shows its effectiveness in protecting the swine industry against the disease. Most of the deaths of hogs resulting from cholera occurred in herds whose owners had not taken the precaution to immunize them.

Meat Investigations

Extensive investigations to study the quality and palatability of meats were continued by the department in cooperation with 25 State agricultural experiment stations and other agencies. Approximately 1,000 cattle were used in the studies, of which more than 150 were slaughtered at the United States Husbandry Experiment Farm, Beltsville, Md. The revenue received from the sale of meat and meat products which remain after the investigations have been completed has returned to the Treasury each year a large proportion of the money appropriated for the experiment. During the last year the sale of products from Government-owned animals amounted to approximately $15,000, in addition to which about $35,000 was returned to State experiment stations which had shipped livestock or meats to the department for various tests and analyses.

Investigation of Animal Fibers

A series of experiments involving wool and mohair have yielded results of interest to the sheep and goat industries. Technical observations of the occurrence of the coarse fibers known as kemp in mohair have explained why kemp fails to dye readily. A comparison of fleeces from Angora goats of different degrees of pure breeding demonstrated the feasibility of eliminating or greatly reducing the occurrence of kemp by the proper selection of breeding stock. The importance of mohair in the textile industry and its wide public use in clothing and upholstery make the results timely as well as of scientific and practical value.

Poultry Investigations

The past year has been one of marked advancement in the department's poultry work. The feasibility of obtaining high egg produc-

tion in poultry flocks continues to be demonstrated at the department's farm near Beltsville, Md., where many visitors have observed the results. The average production of the department's poultry flock reached the highest point of any year. Two of the fowls laid 300 and 312 eggs, respectively. In addition to its regular experimental activities on poultry problems the department's specialists prepared an exhibit and arranged for other active participation in the World's Poultry Congress held at Ottawa, Canada, in July, 1927.

Animal Parasites

Excellent results obtained from the swine-sanitation system, devised by department workers for controlling roundworms of hogs, have suggested the possibility of controlling other animal parasites more effectively. In the case of sheep, which in the South suffer severely from stomach worms, drenching with copper sulphate solution proved an inadequate control measure. Light stocking of pastures was fairly effective as a control measure, but is not conducive to profitable sheep raising under ordinary farm conditions. Investigations are in progress to devise, if possible, suitable means for controlling stomach worms of sheep more effectively in Southern States.

Control of Rabies

The increasing prevalence of rabies in the District of Columbia and adjacent portions of Maryland and Virginia merits the attention of the public as well as of the veterinary and medical professions. As in former years the department pathologists examined and reported on specimens sent to their laboratories for examination. Pennsylvania and Virginia also contributed several cases. Of 236 suspected cases received for laboratory examination, 193 proved to be rabid. This large proportion draws attention to the existence of a menace that is purely the result of public tolerance. The rabid animals were chiefly dogs. The enactment and strict enforcement of muzzling laws are an effective means of reducing this danger to human and animal lives.

Veterinary Education

An impending shortage of trained veterinarians is evident from the reports of enrollment received from the 11 accredited veterinary colleges in the United States. The total number of graduates reported to the department at the close of the school year in 1927 was 115, which is the lowest number on record. The year also marked the closing of the last private veterinary college in the country, leaving the field at present entirely to State colleges.

The present number of graduates is scarcely enough to fill vacancies in the Bureau of Animal Industry alone. There is an additional field for competent veterinarians in private practice, in military service, and in the employ of State and city governments which need qualified men for a wide variety of inspection work. Although there has been a decline in recent years in the number of horses in the United States, the number of horses and mules on farms alone is still more than 20,000,000, in addition to which there is need for

competent veterinary service for cattle, sheep, swine, and other animals. The extensive campaign for eradication of tuberculosis and the present wide interest of the poultry industry in suppressing disease further broaden the veterinary field. Consequently, the veterinary profession seems to offer excellent opportunities.

DAIRY INDUSTRY INVESTIGATIONS

Records of associations for the improvement of dairy herds show that the margin between cost of production and income from the dairy herd becomes greater as production per cow increases. The problem, therefore, may be largely solved by increasing the average production per cow. This can be done most economically through the use of good purebred dairy sires. Dairy-herd-improvement-association records, tabulated and studied in the Bureau of Dairy Industry, show that almost any purebred dairy bull will improve a herd whose average yearly butterfat production per cow is below 200 pounds but that it becomes more difficult to increase yield as average production advances to higher levels.

In many districts of low production, scrub and grade bulls are widely used. By conducting scrub-bull-eradication campaigns, the department is assisting those districts to replace scrub and grade bulls by good purebred dairy bulls. Increased yields per cow follow.

In those districts, however, where average butterfat production is comparatively high the problem is not so easily solved. The records show that only about half the purebred bulls that were mated with cows whose yearly butterfat production was above 400 pounds per cow were able to increase the production of the daughters above that of the dams of the daughters. The sires that have already shown their ability to improve such a herd are the only ones that are at all certain to bring improvement when mated with cows of that class.

Sterility in Dairy Animals

Sterility in dairy animals, both partial and complete, causes losses to the dairyman that are probably as great as are caused by the more dreaded contagious diseases. Partial sterility, requiring animals to be bred a number of times before conceiving, indirectly causes great losses through lowered yearly production of milk. Most farmers breed their cows to freshen every 12 months. If the cows do not conceive for three or four months after the date of first breeding because of some form of sterility, they are likely to be dry three or four months longer than they should be, thus resulting in a loss to their owners during that period.

A problem confronting the dairyman is that of the fertility of sires. It is extremely important to keep good sires fertile as long as possible. The number of years that sires will remain serviceable varies, due probably to differences in management and care. Then, too, many farmers have made it a practice to slaughter bulls when they reach the age of 3 or 4 years because they believe the younger sires are more fertile and less dangerous to handle than older sires. As a result of this practice many valuable breeding animals are destroyed before their period of usefulness is little more than commenced.

Sterility in both males and females may result from a hereditary weakness or may be caused by a lack of exercise, by improper nutritive conditions, or by unwise management. The Bureau of Dairy Industry has been experimenting on the correction of sterility in females, when there was no evidence of pathological conditions, by feeding sprouted oats. About 15 animals that had not conceived from a number of services did so after receiving sprouted oats for periods averaging six weeks. An experiment is now under way to determine the effect of exercise in correcting a lack of tone in the uteri of a number of cows. Investigations show that both exercise and sprouted oats have a marked effect on the number, activity, and life of the sperm cells.

Bottle Breakage in Milk Plants

One of the problems confronting dairymen and milk dealers is how to reduce the loss of milk bottles. The annual cost of replacing bottles that are lost or broken amounts to about $30,000,000. Of this amount, over $12,000,000 results from breakage in the milk plants where milk is bottled. Investigations in milk-plant management include a study of this problem. Surveys are made at milk plants during their operation. Glass broken at various points in the plants is collected and weighed at the end of each day's run, and notes are taken on the types and arrangement of machinery, distances that bottles are moved, and means of conveying bottles from one place to another within the plant. These studies show not only the point at which the greatest breakage occurs but the character and cause of the breakage.

RESEARCH IN ENTOMOLOGY

Studies of the western pine beetle have disclosed facts that should have a wide application in timber-sale regulation, logging practice, and the management of forests where the prevention of bark-beetle losses is to be considered. Preliminary results indicate that, all other things being equal, fast-growing trees offer the greatest resistance to the insect. Very fast growth, thick bark, and large, heavy crowns are evident indications of resistant trees. It is believed that the information on the life history of the insects, the characteristics of the trees selected for attack, and the reaction of the tree during and after attack, will be of great value in obviating and correcting losses from the western pine beetle, at present the outstanding enemy of forest trees in the Northwest.

In the Kaibab National Forest, where there has been for some time an epidemic of the Black Hills beetle, investigation rendered it possible to predict a decided decline in the epidemic on this area, thus saving important expenditures in further control operations. An extremely dry summer with prevailing southwest winds appeared to lower the moisture content of the trees to an extent that the beetles and their larvae were unable to survive in the bark of the trees.

The so-called screw worm which causes losses to cattle, sheep, and goat raisers of the Southwest is coming more and more under control. Following information developed by department workers

in cooperation with State officials, many of the progressive ranchmen have now adopted the practice of burning all carcasses of animals as soon as they are found. Where this work is carried out systematically over a considerable area, the screw-worm hazard has been greatly reduced. In addition, the general use of fly traps has proved highly advantageous and is believed to be susceptible of much further development after additional studies have been made.

Japanese Beetle Campaign

While the Japanese beetle continues gradually to extend its area of distribution, increasing progress is being made in the development of methods of control. The repellant effect on the beetles of ordinary arsenicals, such as arsenate of lead when sprayed on the foliage, has been overcome by disguising the poison with a coating of lead-oleate soap. By the use of this material, fruit growers and others are now able to protect their crops from the horde of beetles present in the worst-infested territory during July and August. Successful treatments for the grubs in the soil have also been perfected and are in extensive commercial use.

An odorous material known as geraniol has proven quite attractive to the Japanese beetle, concentrating the insects in large numbers in a relatively small area, where they may be killed by contact sprays, such as pyrethrum-soap solution. This attractant is also proving effective in luring the beetles into traps from which they can not escape, the widespread use of which must greatly reduce the pest. Parasite introduction and liberation has been prosecuted with all possible vigor and shipments of material are being received continuously from Japan, China, and India. Seventeen species of these parasites have thus far been received, several of which have become established in the New Jersey-Pennsylvania area.

The cotton-growing season of 1926 witnessed a widespread outbreak of the cotton flea hopper, concerned, it is believed, in the distribution of a serious disorder of the cotton plant, which prevents the setting of fruit until the normal period of fruiting is well advanced. While weather conditions permitted the cotton plants in many areas partially to recover from the attack, and so make a late crop, in other regions a heavy loss was attributable only to this and related insects; thus in Madison Parish, La., the cotton yield was reduced by the insect approximately one-half as compared with the preceding year. Fairly satisfactory control was secured in many instances by dusting the plants with sulphur, the effectiveness of the treatment depending upon the occurrence of bright, warm days following applications.

Spray-Residue Problem

Progress continues in the investigations relating to the spray-residue problem. Because of the objectionable character of lead-arsenate residues special studies are under way to develop, if possible, for orchard spraying, poisons other than arsenate of lead. These studies include orchard tests of such materials as the arsenates of lime, iron, aluminum, zinc, barium, copper, titanium, magnesium, and manganese. Several fluosilicates, as barium and sodium, are also

under experiment. A special laboratory has been inaugurated to develop new and unobjectionable insecticides which can be used in place of arsenicals in spraying of fruit and vegetable crops. In cooperation with the Bureau of Plant Industry tests of various methods of washing the fruit in weak solutions of chemicals to remove the spray residue are under way and give great promise of successful commercial application; in fact, washing machines will be utilized largely in the marketing of the 1927 apple and pear crops in the Pacific Northwest.

CORN-BORER SITUATION

The corn-borer situation in the Lake Erie region had become alarming by the end of the growing season of 1926. Surveys during that summer indicated a degree of spread and of infestation in the States bordering Lake Erie far exceeding anything yet noted. The insect was found in the northeastern corner of Indiana and in the entire southeastern one-third of Michigan. There also had been extensive dispersion in Ohio, Pennsylvania, and New York. These circumstances indicated that if decisive steps were not taken immediately to repress the pest the great Corn Belt would soon be invaded. This situation was occasion for the voluntary organization of a committee of corn growers, agriculturists, and business men, who decided that in order to cope with the existing emergency the sum of $10,000,000 in the form of a Federal appropriation would be required.

After consideration by the President, the department, and the Bureau of the Budget this fund was provided by Congress, and Federal and State officials and others worked out a plan of corn-borer control involving the thorough clean-up of cornstalks and of all corn débris in all cornfields, for which the farmers would be reimbursed not to exceed $2 per acre for such work as was additional to that which was normal and usual in ordinary farm operations. Despite serious interruptions due to a late spring, the clean-up campaign was carried out with the destruction, according to careful estimates, of 95 per cent of the borers throughout the treated area of some 2,500,000 acres.

A census of the corn-borer population, as determined by actual count in the field during the months of August and September, 1927, in Michigan, Ohio, New York, and Pennsylvania, shows that there is now an average of 13 borers per 100 stalks in the campaign area as compared with an average of 8 borers per 100 stalks last year. In 1925 the borer population in this area was 2 borers per 100 stalks. Although this makes an increase of 50 per cent in borer population this year, it compares favorably with the increase of 400 per cent in borer population registered in 1926 when there was no control campaign. Had there been no campaign this spring, judging by the increase in 1926, there might now be about 32 instead of 13 borers per 100 stalks. The corn borer continues to spread northward, westward, and southward, as indicated by scouting, which is still going on.

At a meeting of the organization of corn growers, agriculturists, and business men, held in Detroit, Mich., September 23, 1927, the organization expressed hearty approval of the control campaign.

Boll Weevil

Continuation of general drought conditions in the Cotton Belt in 1926 reduced damage by the cotton-boll weevil during that year. However, large amounts of poison were used on cotton, primarily for the leaf worm, which covered much of the territory west of the Mississippi River, with lighter injury in parts of Mississippi and Alabama. While this poison helped to destroy the weevils in the areas treated, the absence of rains during the later months of the season was probably more important in effecting a large degree of natural control.

As a result the insect entered hibernation in greatly reduced numbers in most of the Cotton Belt. Owing, however, to the fairly mild character of the winter of 1926–27, the percentage of weevil emergence in the spring was higher than for some years. The fairly abundant hold-over of weevils, coupled with climatic conditions favorable to the insect during the succeeding months, resulted in boll-weevil damage to cotton during 1927 considerably more extensive than had been experienced for several years.

EXCLUSION OF PLANT PESTS

The exclusion of foreign pests injurious to agriculture (of which there are many which fortunately have not become established in the United States) continues to be one of the vital problems of the department. To accomplish this end, 20 foreign quarantines and several regulatory orders are now enforced, restricting, controlling, and safeguarding (by inspection, and, where necessary, disinfection) plants and plant products at ports of entry. Plant quarantine inspectors are stationed at all of the more important ports of entry; and during the year, a number of major pests have been intercepted in plants and plant products arriving as commercial shipments, ships' stores, and passengers' baggage, and in foreign parcel post. Likewise, all railway cars returning from Mexico have been inspected for cottonseed which may be the means of introducing the pink bollworm into noninfested sections of this country. As an additional precaution, all cars representing risk were fumigated in Federal car-fumigation houses.

Information gathered as a result of the inspection of plants and plant products at the port of entry frequently indicates the necessity for a more complete knowledge of the pest risks which accompany plants and plant products, if these products are to continue to enter under permit. This knowledge can be secured only by field examinations conducted by qualified specialists during the growing period. The department recently conducted such a field examination of Argentine fruits (particularly grapes) for the purpose of determining whether these fruits are subject to attack by injurious pests, including fruit flies. As a result of this survey, it has been determined that grapes and certain other deciduous fruits grown in the Temperate Zone of Argentina may continue to enter, upon inspection, at northern ports.

Protection of Uninfested Areas

Growers of agricultural products are finding introduced plant pests a serious obstacle to profitable agriculture. Many such insects and plant diseases entered the United States early in its history and have become established throughout the country. Others have come in during the last generation, and the spread of those having a local distribution is in a number of cases being distinctly retarded or completely stopped by quarantine measures administered by the department.

The plant act of 1912 has enabled the department largely to prevent the continued introduction of such agricultural enemies, and most imported products of the farms, gardens, and forests of other countries now enter the United States under restrictions which reduce such a possibility to a minimum.

The most recent outbreak of an introduced insect and one which offers a real chance of total eradication, is that of the Mexican fruit worm in the lower Rio Grande Valley of Texas. This insect is a native of southern Mexico, where it has been known to exist for many years attacking a variety of fruits, especially grapefruit, oranges, mangoes, peaches, and guavas. The danger to American fruit production from its presence in Mexico has been recognized for 30 years or more, and since the passage of the plant act a quarantine has been in effect prohibiting the entry of all known host fruits from Mexico.

Eradication by Starvation

An attempt to eradicate the pest by starvation is now in progress and is receiving the hearty support of the residents of the infested district. A preliminary step, in advance of having funds available for this emergency, has been the adoption of quarantine restrictions under which fruit from State inspected and certified orchards may be shipped interstate on condition that the eradication measures are meticulously followed throughout the entire infested area. A most hopeful feature of the situation is a natural barrier zone in the form of an arid region surrounding the fruit-growing district.

The maintenance of a similar though more artificial barrier zone for preventing gipsy-moth spread in the New England States has been successful in stopping the progress of that infestation. In fact the apparent local eradication of the moths from a number of border townships has enabled the department to release them from quarantine and thereby increase the width of the barrier zone area.

The extent of the department's activities in retarding the introduction and spread of plant pests is indicated by the fact that it is now administering 11 quarantines affecting interstate shipments, 8 restricting the movement of articles between the continent and the Territories of Hawaii and Porto Rico, and 21 governing plant and plant product importations from foreign lands. Two domestic quarantines cover every State of the country, and each of four others relate to six or more States. Specific pests of cotton, corn, flowers, vegetables, tropical fruits, deciduous fruits, forest trees, and ornamental nursery stock are included among the infestations made the subject of domestic quarantine regulations, and the foreign quarantines cover an equally wide range.

Effectiveness of Control Measures

The final effectiveness of quarantine action relating to localized infestations within the United States depends on the nature of the pest and its method of distribution. Diseases with wind-borne spores (such as the white-pine blister rust) and active, rapidly flying insects (such as the Japanese beetle) are spreading locally in spite of stringent restrictions on the movement of infested products. On the other hand, the dissemination of soil-borne diseases (such as the potato wart) and comparatively sedentary insects (such as the gypsy moth and the date scale) is completely prevented by efficient quarantine administration.

In the former class regulatory measures are being directed primarily toward preventing the establishment of isolated outbreaks which would result from the carriage of pests for long distances in commerce. In this particular the European corn borer, cotton pink bollworm, Japanese beetle, and blister rust, quarantine measures have been markedly successful. The separate areas in which there exist infestations of the pests named in most cases represent separate introductions from foreign countries prior to the American legislation on the subject.

The court decision and subsequent Federal legislation of 1926, outlined in the last report, closed the door to State quarantine action on infestations covered by Federal regulations and have therefore necessitated a close examination of each quarantine problem to determine whether it can best be handled by the States or by the Federal department. The recent extension of the Federal white-pine blister rust quarantine to the entire United States, replacing a multiplicity of diverse State quarantines, was a direct result of this situation. Certain problems, of which citrus canker, alfalfa weevil, and potato wart are examples, are at the present time being solved more effectively by State quarantine action than would be possible under Federal regulations without excessive expenditures, and are therefore left with the States.

CHEMISTRY RESEARCH

In efforts made by the Bureau of Chemistry to discover some method for utilizing the short-fiber cellulose present in farm wastes, a series of experiments on peanut hulls produced a cellulose pulp which seems to offer interesting possibilities as a raw material for rayon. Straw, stalks, hulls, and other farm materials are being studied for the purpose of discovering methods of more profitably utilizing such materials.

A method has been developed by the bureau for the recovery of paracymene, a waste by-product in the manufacture of paper pulp, which has great possibilities of development as a thinner for paints, varnishes, and lacquers, and also in the preparation of an insoluble resinous compound with excellent insulating properties. Orthodichlorobenzene, a by-product in the manufacture of chlorobenzene, was shown to be an excellent cleanser for metals. The utilization of waste products and the more profitable utilization of what may be called farm by-products are real efforts of conservation.

Insecticides Developed

As a result of chemical work on insecticides conducted this year, a method for the rapid field determination of sulphur on foliage and fruit treated with sulphur preparations was devised, the composition of colloidal calcium arsenate was determined and the best method of preparing it was worked out, and the general investigation of the chemistry of calcium arsenate, which has been under way for several years, was concluded. The chemical and physical properties of 12 crystalline arsenates of calcium, several of which are new, have been reported. Calcium arsenate is the most effective agent now known for use against the cotton boll weevil.

Results of a series of experiments to find an effective synthetic nicotine substitute indicate that it may be possible to manufacture such a substance at $1 or less a pound, as against $3, the present price of a pound of nicotine. One of the greatest needs in the war upon insects is a cheap and effective contact insecticide. If our chemists can succeed in synthesizing such a compound it will afford a striking example of the value of chemical research to agriculture.

Weevils in grain are a matter of deep concern to farmers, shippers, and warehousemen. Several highly promising new fumigants have been developed from the department's laboratory fumigation tests with some 300 organic compounds, supplemented by tests in box cars, chests, and a fumigating chamber. Perhaps the most promising fumigant for use against grain weevils is a mixture of ethylene dichloride (3 volumes) and carbon tetrachloride (1 volume). This mixture is noninflammable and cheap, has a pleasant odor, and is relatively nontoxic to man.

Prior to the work done in the department to obtain satisfactory attractants and repellents for flies which infest animals, strongly odorous materials, such as pyridine, bone oil, fish oil, and nitrobenzene, were recommended as fly repellents. The department's investigations have proved that copper carbonate, an inodorous compound, is more effective in repelling flies from meat than any of the highly odorous materials tested. The effectiveness of pine-tar oil as a repellent dressing for wounds of domestic animals has been demonstrated. Large manufacturers of proprietary screw-worm fly killers and repellents are using pine-tar oils as the basis of their preparations instead of coal-tar phenols as before.

New Methods in Sugar and Sirup Production

Because of the need of diversifying the utilization of products from sugar cane, the possibility of producing unsulphured cane sirup of good quality from low-purity cane juice and of manufacturing the new cane product, cane cream, mentioned in last year's report, was investigated. A good blending sirup can be made from low-purity juices, and, when blended with low-purity refinery sirup, it gives a sirup of excellent quality. Several hundred cases of cane cream were manufactured and distributed commercially for the purpose of learning the reaction of the consuming public toward this new cane product. The origination of new products affords greater flexibility in meeting market conditions, which is of prime importance to the cane-sugar industry of continental United States. These

investigations illustrate the manner in which chemical technology can be applied for the purpose of facilitating the marketing of agricultural products to the benefit of the producer.

Tests of Sugar-Bearing Juices

In preparing cane and beet juices for recovery of sugar by crystallization, nonsugar substances in the colloidal state interfere with the process. The removal of these materials to the greatest extent possible is desirable. By the use of an improved method developed in the Bureau of Chemistry it became possible this year for the first time to estimate rapidly the quantity of colloids in sugar-bearing juices. This method, termed the "dye test," together with ultrafiltration, has given important information relating to the effect of cultural conditions and deterioration on the quality of the plant juices, information of special value in the study of clarification problems. The dye value has been found to be an index of the refining quality of raw sugar. Realizing the value of such a test, both refiners and manufacturers of raw sugar are adopting it as a measure of controlling or improving their factory operations.

Lignin

Investigations initiated by the bureau in 1920 upon the utilization of corncobs and other agricultural wastes for the production of the chemical furfural are now being applied commercially. An important constituent of cellular products such as corncobs, cornstalks, straw, etc., which is now almost entirely wasted, is lignin, which makes up from 20 to 30 per cent of the dry material. The bureau has succeeded in converting lignin into varnishes, dyestuffs, and various aromatic chemicals which give great promise of commercial utilization. Lignin may be called the greatest of all unutilized agricultural wastes, and it occupies with respect to industrial possibilities the same position that was held by coal tar a century ago. The bureau has published one article upon lignin from corncobs (Jour. Amer. Chem. Soc. 49:2037), and other contributions upon the subject are in course of preparation.

Gossypol

A research fellowship, established by the Interstate Cottonseed Crushers Association, is devoted to an investigation which is being conducted in the laboratories of the Bureau of Chemistry and Soils upon gossypol—a poisonous phenolic constituent of cottonseed. The presence of gossypol in cottonseed meal has resulted occasionally in the death of farm animals that have eaten too large a quantity of this substance. The results thus far obtained under this fellowship have thrown new light upon the chemical constitution of gossypol. When this phase of the problem has been solved experiments will be made upon the application of the information to the detoxification of cottonseed products.

Enforcement of the Food and Drugs Act

The Federal food and drugs act, designed to prevent the sale of adulterated or falsely labeled foods, drugs, and feeding stuffs, is a

benefit to consumers and producers alike. Through its enforcement the consumer may feel confident that the products he buys are what they are represented to be on the labels and the producer need fear no competition with low-grade goods masquerading as high-quality goods. Cooperation with the various industries in an effort to keep their products in conformity with the law and action against producers found guilty of deliberately adulterating or misbranding their goods were continued during the fiscal year just ended.

Particular attention to citrus fruit was necessary this year because of the cold wave which swept over Florida in January, frosting much of the fruit then ripe or ripening on the trees. To protect the industry against the stigma bound to result from the sale of large quantities of juiceless oranges, as well as to safeguard the interests of the consuming public, the department issued announcements warning shippers of the worthlessness of frozen fruit and reminding them that regulatory action would be taken against any shipments found to be dried beyond a specified tolerance. Some unscrupulous shippers disregarded these warnings and attempted to place unfit fruit on the market. Legal action brought in such cases resulted in the seizure of 142 shipments.

Drugs

An outstanding phase of the work under the food and drugs act on drug products was the completion of an investigation begun several years ago of all pharmaceutical preparations on United States markets. During the year 45 per cent of all samples of such products collected in the East were either grossly deficient or contained an excess of the active medicinal ingredient. Such variations may be due to imperfect mixing or to the natural deterioration of some of the ingredients, such as nitroglycerin. Although it is difficult to prepare uniform pharmaceutical preparations, adequate control measures in manufacture would go a long way in preventing wide discrepancies between the label declaration and the condition of the product. The importance of being able to rely on the potency of these preparations is obvious.

So-called acidophilus and Bulgaricus preparations have flooded the market during the last two years. An examination of the output of 21 representative manufacturers led to the conclusion that most of these products are useless. Ninety per cent of the samples examined contained few or no active organisms and those that did show them contained the organisms in such small quantities that it would be necessary to consume enormous quantities of the preparations to derive any benefit. Warnings of the uselessness of these products and of the Government's intention to free the market of misbranded, deteriorated, or contaminated pharmaceuticals have been sent out to the trade.

Insecticides and Fungicides

Every year the department's inspectors operating in connection with the enforcement of the insecticide act of 1910, cover the field of commercial insecticides and fungicides fairly thoroughly. The older insecticides and fungicides become standardized and are recom-

mended by the manufacturers to be used in the manner and for the purposes for which they are effective. They are therefore easier to supervise. Each year, however, many new products are put on the market, oftentimes by manufacturers who are ignorant both of entomology or plant pathology and of the law. Some of them are worthless, some are valuable products.

In either case they are likely to be labeled with false and misleading statements and to lack the "active and inert statement" required by the insecticide act. Samples of this type require constant supervision and thorough analytical control. Some of the newly developed insecticides and fungicides show signs of a general usefulness. Among these may be cited the fluorides and fluosilicates, pyrethrum extracts, organic mercurials and copper carbonate. Materials of this type are studied both with regard to their physical form and the conditions under which they must be used so that their labels may be intelligently criticized.

Some time ago products consisting essentially of salt, sulphur, and lime or charcoal began to appear on the market. They were recommended for internal administration to animals to combat flies with which the animals are infested. These products were tested and found to be worthless. As a result a campaign against them was undertaken and they now seem to have disappeared from the market.

Calcium Arsenate Studied

From time to time it is necessary to undertake the basic study of the chemical nature of an insecticide for the better understanding of the composition of commercial preparations containing it. Calcium arsenate, in particular, is a rather complex material. An investigation of all the compounds of lime and arsenic acid which has been under way for several years has been completed. Twelve definite compounds have been prepared in pure form and their physical and chemical properties have been studied in detail. A complete account of this work will be published.

The estimation of residues left upon fruit and foliage after spraying is often important, for reasons of health in the case of arsenicals, and for the estimation of adhesiveness and lasting qualities in other cases. Quick field methods are desirable and such a method has been developed for detecting and estimating the quantity of sulphur left after spraying with lime-sulphur solutions or other sulphide preparations. This method is being used by the inspectors of the Office of Blister Rust Control for determining whether currant and gooseberry bushes have been dipped in lime-sulphur as required by law.

THE SOIL SURVEY

The soil survey covered a total area, during the fiscal year 1926–27, of 23,199 square miles. Work in soil mapping was carried on in 69 survey projects, one or more projects being located in each of 28 States. All projects were surveyed in cooperation with some State organization.

The work of the soil survey is done primarily for the purpose of accumulating data on the basis of which the fundamental principles of soil genesis development and use may be formulated. In doing this the study of the soil in its natural place is indispensable. Inten-

sive studies not possible by field methods or equipment are necessary also, however, if the whole story is to be told. This work must be done in the laboratory and must be performed on material brought to the laboratories from the field. The collection of material for this purpose must be performed in the light of the knowledge obtained by field investigation. Accordingly, much time and attention have been devoted to the methods of collecting samples.

Soil-Erosion Studies

Our soil specialists find that here, as in other parts of the world, failure to hold the absorptive surface soil of fields and pastures against the denudation of erosion has contributed to a much more rapid removal of the water that falls upon these eroded lands. The mellow topsoil that is gone was far more retentive of moisture than the comparatively impervious subsoil that sheet erosion has left behind. These specialists believe that this wastage of the soil has as much to do with the constantly increasing floods as all other factors combined. Many streams navigable a generation ago are now clogged with soil débris.

Failure to build terraces on sloping fields generally and to plant grass and trees on the steeper lands highly susceptible to rain wash accounts for much of the excess of water now sweeping down the Mississippi. If this kind of soil wastage on an enormous scale is not stopped there is little likelihood that floods will be controlled. Practically nothing is being done about this phase of flood prevention. There are no hillside terraces north of the Arkansas River. The entire topsoil is gone from hundreds of thousands of acres in western Virginia, western Pennsylvania, eastern Kentucky, and southeastern Ohio. From these lands rain water courses much faster to the Mississippi than formerly. Terraces and grass wood lots, forests, and soil-binding and soil-building crops will vastly improve the flood situation. Not only will they slow up the run-off of water, but they will save the most valuable part of the soil, and will reduce the clogging of streams, which cuts down their carrying capacity and adds to the flood danger.

Congress of Soil Science

From the agricultural viewpoint one of the outstanding scientific events of the year was the assembling of the First International Congress of Soil Science at Washington from June 13 to 22, 1927. Official approval of this congress by the Federal Government was contained in a joint resolution enacted April 3, 1926, which empowered the President to extend formal invitations to foreign governments to be represented by delegates. The International Society of Soil Science, headed by J. G. Lipman, of New Jersey, sponsored the congress. D. J. Hissink, of Holland, served as general secretary.

FERTILIZER AND FIXED-NITROGEN INVESTIGATIONS

The year witnessed progress in the development of a more consistent and comprehensive program of research in fertilizer technology, on the one extreme embracing the raw materials involved and on the other their actual application under field conditions. The

investigations include all the chemical elements of recognized fertilizer value, but of necessity are concerned principally with nitrogen, phosphorus, and potassium. Work done in the American nitrogen-fixation industry promises at an early date increased supplies of agricultural nitrogen from this new source. The department's laboratories served the industry by supplying fundamental data and engineering details.

The immediate product of nitrogen fixation being ammonia, the efficient elaboration and conversion of that gas into a diversity of nitrogen compounds for agricultural use—such as nitrates, urea, and ammonium phosphate—have been vigorously prosecuted. This has resulted in the development of new compounds and mixtures whose adaptability to fertilizer use has been tested through a study of their physical properties, and their behavior on mixing and storing. Their adaptation to use in seed drills has also been tested. At the same time the search for new or enlarged supplies of organic nitrogenous substances among agricultural or trade wastes has been fruitful.

The year recorded further progress in the development of chemical processes of recovering agricultural potash from the potash-bearing minerals and trade wastes, of which there are liberal supplies in this country favorably situated with respect to agricultural areas. By-products to share the manufacturing costs of the potash are an essential of modern potash recovery. The department's investigations therefore consider primarily the useful products obtainable concurrently with potash from these raw materials. American agriculture is still dependent on Europe for 75 per cent of its potash requirements. A serious deterrent to the use of potash is the cost of its transportation which can be overcome only by the development of American potash industries situated closer to the farms.

AGRICULTURAL EXPERIMENT STATIONS

Federal acts appropriating money for the support of the agricultural experiment stations place upon the department the responsibility of administering these funds. The relationships thus established have tended to develop a community of interest and spirit of cooperation which have greatly strengthened the effort to promote agricultural research and extend its benefits.

The income of the State experiment stations for the current year from the Hatch, Adams, and Purnell funds amounts to $3,360,000 and will increase under the terms of the Purnell Act $480,000 annually until it reaches a total of $4,320,000 for the fiscal year 1930 and thereafter.

The increasing Federal support of the stations provided by the Purnell Act is steadily expanding their research program, making possible broader and more effective cooperation with the department. Such cooperation has already resulted in a marked advancement of study of some of the larger national problems affecting agriculture, especially in the economic field, but also in the fields of food production and its use in the home and home betterment.

Joint committees of department and station representatives are functioning effectively in promoting cooperative study on a wide scale of marketing and distribution of farm products, of vitamin

content of foods and their relation to human nutrition, of rural home management, rural social organizations and agencies, and of factors affecting the quality and palatability of meat.

The total income of the stations from all sources is now close to $12,500,000, and their program of investigation is as broad as the field of agriculture itself. The amount of funds involved and the conditions under which they are granted, the wide interests to be served, and the exacting character of effective research place a heavy burden of responsibility on those who administer these funds, in order that a high standard of productive research, measuring up to the needs and expectations of the public and justifying the generous support of Congress and the States, may be maintained.

INSULAR EXPERIMENT STATIONS

The agricultural experiment stations maintained by the department in Alaska, Hawaii, Porto Rico, Guam, and the Virgin Islands, established by specific authority of Congress, are trying to develop for each region types of agriculture adapted to the needs of the people. In Alaska the problem has been that of establishing an agriculture suited to the seasonal variations in so large a region. In Hawaii and Porto Rico diversification of agriculture is the main problem. The large industries of sugar production and pineapples are well cared for by stations supported by the industries, and in Porto Rico the sugar industry is able to solve most of its problems. As a consequence the stations are doing little with these major crops and are devoting their attention to minor crops that will not compete with the larger ones but supplement them and furnish outlets for capital and industry that are not employed in the larger plantation operations. This diversification it is believed will tend to build up a better citizenship. In Guam the station is endeavoring to improve agriculture and agricultural practices that were in an unsatisfactory state. In the Virgin Islands changed economic conditions called for a greater agricultural development, and the station is trying to develop new lines of production.

Every station has made progress in the field which it has tried to cover, and the way to successful enterprise has been pointed out to many to whom the established industries were closed. In all their work research has been kept in the foreground, and the results of the experiments have been given application in other regions somewhat similarly situated.

In providing for the insular experiment stations Congress established a policy separate from that governing its relations with the stations in the several States—that is, the centralized control of the institutions. It was believed the Federal acts making appropriations to the States were not applicable in the various Territories and possessions. Greater latitude was given to the use of the funds, as it was recognized that none of the regions could profitably and economically carry out the requirements of the laws under which grants are made to the States.

WILD-LIFE EXPERIMENT STATIONS

Of vital concern to the continuance of the fur trade, which is one of the oldest industries of the country, is the perpetuation of

the source of supply of raw materials. So popular have fur garments become that the demand for pelts is ever increasing. As a result overtrapping has been stimulated until fur-bearing animals are rapidly diminishing. Reports to the department indicate that the catch of fur in the wild has greatly fallen off in the past two years. Seeing the inevitable approach of this condition far-sighted men began several years ago to raise fur animals in captivity to supplement the natural supply, and fur farming is now a flourishing industry.

For several years appropriations have been made available for the department to make investigations, experiments, and demonstrations in connection with the raising of fur-bearing animals and to study their geographic distribution and relations. To provide great quantities of attractive furs at reasonable prices, the dwindling stocks have been further supplemented in recent years by the production of suitable breeds of rabbits for fur, the meat being utilized for food, particularly in the West.

That it may study the problems confronting producers of fur of all classes and advise them in the early stages of their undertakings, the department maintains a fur-animal experiment station in the Adirondack region, N. Y., and at the close of the year it had completed arrangements for establishing a rabbit experiment station in southern California.

Two other wild-life experiment stations are maintained by the department, one near Fairbanks, Alaska, for studying problems in reindeer production, including herd improvement and range management, and the other in Colorado for developing efficient methods of controlling injurious rodents and predatory animals, from both of which practical results are being obtained. In addition, studies of experimental areas and of animals under selected environmental conditions are being made to furnish a basis for intelligently directed control efforts.

Animal Pests of Crops and Stock

Predatory wild animals, particularly wolves, mountain lions, bobcats, coyotes, and lynxes, take heavy toll of sheep, young calves, poultry, and other livestock, and make serious inroads on wild stocks of game, including deer, elk, and their young, as well as on ground-nesting game birds. In control campaigns directed by the department against predatory animals in the last fiscal year, the skins or scalps of 47 big gray wolves, 154 red wolves, 37,887 coyotes, 246 mountain lions, 3,677 bobcats, 41 Canada lynxes, and 186 predatory bears were taken, representing a saving of $5,500,000 to livestock and wild game. All of this was accomplished in cooperation with 11 range States, which through their legislative bodies, counties, and stock associations, added approximately $370,000 for the various control campaigns to the $274,400 available in departmental funds.

The department supervised control of injurious rodents in 14 States west of the Mississippi River and in 11 of the Eastern States. Prairie dogs, ground squirrels, pocket gophers, field mice, rabbits, woodchucks, house mice, porcupines, and rats are the cause of much damage to growing and stored crops in farming districts as well as of much concern on grazing lands on national forests and other public domain. The States contributed funds for the rodent-control

campaigns to the extent of $641,600, counties, stock associations, and individual farmers and ranchmen cooperating. In conjunction with $165,600 from the department's appropriations, this resulted in the treatment of 14,991,968 acres of infested Federal, State, and private lands. The savings thus effected in crop and range grasses for the year are conservatively estimated at $5,700,000. The funds used in control campaigns against both predatory animals and injurious rodents, including investigations of eradication methods, totaled more than $1,000,000 from cooperators and slightly less than half a million from funds of the department, the grand total being $1,473,294.

The Game-Bird Supply

With increasing population and its correlated activities, the felling of forests, the draining of marshes, and the numberless developments that accompany the more intensive occupation of the land, it is inevitable that there should be some reduction of our wild life. This is especially evident in the case of our game birds, and notably during the past 25 years. The department has endeavored to check this decrease as far as possible by education regarding the value of our wild life and by the encouragement of salutary legislation. No game birds are more important than the waterfowl. State, Federal, and international protection have helped stem the tide of destruction, but the real extent of our wild-fowl resources is in doubt. It is now planned, however, by a nation-wide series of simultaneous observations to be made by trained volunteer cooperators, to gain a clearer view of conditions and enable the department to meet intelligently problems of game portection.

Legal Protection of Birds

The enforcement of the migratory-bird treaty act, which is under the direction of the department, is designed to carry out the terms of the treaty between the United States and Great Britain by which the two countries undertake to provide protection for the song and insectivorous birds, the waterfowl, and the shore birds that migrate between the United States and Canada. The activities of Federal game wardens have improved greatly the conditions affecting the maintenance of these valuable creatures. The destructive practice of the spring shooting of migratory waterfowl has been stopped generally, the sale of migratory game birds has been prohibited, and violations by market gunners have been reduced. The migratory song and insectivorous birds, so valuable to agriculture, are now given the protection of a closed season under the provisions of this act. The Lacy Act, which is also administered by the department, prohibits the interstate shipment of wild animals in violation of State laws, and the cooperation extended in the enforcement of this act has resulted in an increased revenue to the States through the institution of prosecutions based on evidence furnished by United States game wardens. The effect has been to restrict greatly illegal traffic in furs and in the carcasses of wild animals.

Perpetuation of Elk Herds

Through its administration of the winter elk refuge, near Jackson, Wyo., and of the national forests, which, aside from the Yellow-

stone National Park, include the principal remaining elk ranges, the department has been keenly interested in the so-called "elk problem," centered largely in the State mentioned. The elk of this region comprise the last of the big-game herds that formerly ranged nearly across the continent. Although summer forage for elk is ample, the winter range has become greatly restricted through settlement of the country, and in unusually severe winter seasons the feeding conditions for the elk are deplorable and many of the animals die of starvation.

To consider the elk problem and provide remedies for present conditions, an elk commission, members of which were designated by the chairman of the President's Committee on Outdoor Recreation from representatives of Federal and State Governments and of important conservation organizations, met in Washington early in March.

Elk Commission's Findings

The commission's recommendations, recently published, were that provision should be made for an optimum number of 20,000 elk in the so-called Jackson Hole herd, to which special consideration was given at that time, the needs of other elk herds to be considered later; that certain additional lands be acquired for winter-refuge purposes along Jackson Valley; and that as a basis for future administration of the herds studies be made of the life history of the elk. In accordance with this last recommendation the department has begun an intensive study of grazing and feeding conditions for the elk and of their parasites and diseases by cooperation of several of its bureaus and other interested agencies.

Upper Mississippi Wild-Life Refuge

More than 60,000 acres, from all sources, have been acquired for the Upper Mississippi River Wild-Life and Fish Refuge, for which Congress has authorized an appropriation of $1,500,000. The people of the surrounding region and conservationists generally throughout the country have supported enthusiastically the establishment of this refuge. Eventually the refuge should include about 165,000 acres of lands subject to overflow along the Mississippi between Wabasha, Minn., and Rock Island, Ill. The limitation of $5 an acre as the average price that may be paid for land, slowed down the acquisition work considerably during the year. Most of the land desired commands a higher price, and under the present limitation it is not likely that more than 10,000 acres can be added during the coming year. The funds provided probably are ample for the purpose, but it is desirable to increase the existing average limit per acre, for prolonged efforts to purchase at the present figure will increase the overhead cost materially.

EXTENSION WORK

The cooperative extension staff at the end of the fiscal year numbered 5,055 persons, an increase of 90 during the year. Of this number, 3,603 were employed in the counties, 2,263 being in agricultural work, 910 in home demonstration work, 153 in boys' and girls' club work, and 277 in extension work with negroes. Subject-matter specialists located at the State agricultural colleges numbered 977, of whom 774 were full-time and 203 part-time workers. Administrative

officers, supervisors, and assistant supervisors numbered 475. These figures show an increase of 90 county workers and 5 administrative and supervisory workers, with a decrease of 5 subject-matter specialists.

Total funds available for cooperative extension work during the year amounted to $20,148,800, an increase of about $350,000 over the previous year. Of this amount, 36.3 per cent was contributed by the Federal Government, 28.4 per cent from State appropriations, and 35.3 per cent from county appropriations and contributions of local organizations. Approximately 95 per cent of all funds used for cooperative extension work came from public sources. The allotment for extension agents in the counties was $12,629,042, or 62.7 per cent of the total; administrative expenses were $1,134,080, or 5.6 per cent, and supervision of county extension workers cost $2,188,512, or 10.9 per cent of all extension funds. The cost of employment and maintenance of subject-matter specialists was $3,831,492, or 19 per cent of the total. The remaining 1.8 per cent was expended for activities of the Federal Extension Service in Washington.

Improvement in Farm Practices

Reports of extension agents showed that in more than 4,100,000 instances improved practices were adopted on the farms and in the farm homes in 1926, an increase of more than 100,000 over the previous year. The principal projects in which improved practices were adopted were the growing of cereals, legumes, forage, and horticultural crops, dairying, animal husbandry, rural engineering, agricultural economics, foods, nutrition, house furnishing, home health, and sanitation. Demonstrations, meetings, tours, campaigns, and press articles were among the effective means of bringing desirable practices to the attention of the rural public. More than 222,000 volunteer local leaders gave important assistance to paid extension workers.

Enrollment in boys' and girls' 4-H clubs was 586,156, of whom 62.8 per cent completed the projects in which they were engaged. This was an increase of 21,000 in total enrollment and of 39,000 in the number completing their assigned work. Nearly 50,000 volunteer local leaders assisted the paid extension workers in the training of boys and girls. The club members were enrolled in 41,234 local clubs.

Emergency Activities

Extension workers gave aid in meeting serious emergency situations which arose during the year in different sections of the country. The sharp fall in cotton prices in 1926, due to the very large crop, led to the adoption of an extension program to lessen the financial distress of cotton growers. Extension workers urged farmers to grow cash crops other than cotton, to increase their acreage of feed crops, and to grow at home more of the food consumed by the family. They advised increases in dairying and poultry raising, both to provide additional dairy and poultry products for home use and to supplement cash incomes. Corn, annual legumes, potatoes, and sweet potatoes were grown on increased acreages.

The damage to farm property in southern Florida by the hurricane of September 18, 1926, made it necessary for farmers to find sources of income from which quick returns could be obtained. Ex-

tension agents aided in relief work and in helping farmers to obtain loans for the purchase of seeds and supplies.

Motion Pictures

Eighteen new motion pictures were completed during the year, the more important being 3 reels on the corn borer and its control, a 2-reel picture on cooperative marketing, and 6 reels on road building in the national parks. A 2-reel picture on women's vacation camps, and 3 reels illustrating farmers' week meetings at western colleges portrayed some of the newer developments in extension work. The department now has 222 different motion pictures, of which 1,792 copies are available for circulation.

FEDERAL-AID ROAD CONSTRUCTION

By completing in the last fiscal year the construction of 8,306.9 miles of the Federal-aid highway system not previously improved with Federal assistance, the total thus improved was increased to 64,209.7 miles, or approximately a third of the total of 185,772 miles of important interstate roads in the system. As more than an equal mileage has been improved by the States without Federal aid it is probable that about three-quarters of the system is now initially improved.

In addition to the new construction above reported, secondary stages of improvement were completed during the year on 1,376 miles previously improved with Federal aid. This secondary improvement consists largely of the surfacing with gravel of roads previously graded, or the further improvement of gravel roads by surfacing with a higher type of material. This is necessary to enable the low-type highways to withstand the constantly growing traffic, which, following the upward curve of motor-vehicle registration, has doubled since 1921, the year in which the Federal-aid highway system was designated.

The Federal-aid roads now completed are classified according to type of surface as follows:

Type of surface	Miles
Graded and drained	10,798.9
Sand-clay	5,721.7
Gravel	25,547.6
Waterbound macadam	1,309.9
Bituminous macadam	3,680.0
Bituminous concrete	1,818.9
Portland cement concrete	14,391.3
Brick	773.8
Bridges	167.6
Total	64,209.7

In addition to these completed roads, 10,103 miles were under construction at the end of the fiscal year, and 2,395.6 miles had been approved for construction. These projects with others to be initiated later will constitute the program of the coming year.

The Federal-aid highway system, in which all of these roads are included, is limited in each State to 7 per cent of the total mileage of highways, and within this limitation includes the most important interstate and intercounty highways. The Federal appropriations

which are applied to the improvement of the system are apportioned among all the States in proportion to their area, population, and mileage of rural post roads. On this basis each State receives a part of each appropriation, which, in proportion to the mileage of the designated system, is greatest in the Middle Atlantic and New England States and least in the West and East South Central States.

Ranked on the basis of the average density of highway traffic the several sections of the country are found to take practically the same order, thus indicating that the apportionment of Federal aid is highly consistent with traffic requirements.

National-Forest Highways

The improvement of national-forest highways is of particular importance in the 11 Western States and Alaska, not only for the protection and development of the forests themselves, but also to provide means of transportation across them. As practically every transcontinental road must at some point pass through one or more of these areas, it is essential that there be a close correlation between the forest-road construction and the program of Federal-aid road improvement. This has been accomplished by the establishment of a forest-road program through the cooperation of the Bureau of Public Roads, the Forest Service, and the affected States.

The more important roads from the standpoint of transforest communication are constructed under the supervision of the Bureau of Public Roads; those required mainly for the protection and administration of the forests are built and maintained by the Forest Service.

Roads of the first class constructed during the year by the Bureau of Public Roads have an aggregate length of 452.8 miles, of which 378.9 miles are in the 11 Western States and Alaska, and the remaining 73.9 miles are widely scattered in the Eastern States. Added to the mileage previously completed these roads advance the total completed to 3,498.5 miles, located by States, as follows:

Mileage of forest roads completed to June 30, 1927

Alaska	151.62
Alabama	5.00
Arizona	237.12
Arkansas	56.76
California	252.16
Colorado	265.96
Florida	61.24
Georgia	18.50
Idaho	439.58
Minnesota	34.57
Montana	343.61
Nevada	103.91
New Hampshire	3.59
New Mexico	164.17
North Carolina	36.27
Oregon	516.61
South Carolina	5.27
South Dakota	41.51
Tennessee	37.83
Utah	285.00
Virginia	11.88
Washington	188.30
Wyoming	234.90
Total	3,498.45

Distribution of Surplus War Material

The distribution of surplus war material begun by the department in 1919 was brought to practical completion during the past year. Only a small quantity of explosives now remains and this will be distributed during the coming year. The total value of the material distributed, exclusive of explosives, is estimated at $242,500,000, and practically all of it has been used by the States in furtherance of the improvement of the highways.

The material distributed, including motor trucks, tractors, road-building equipment, and tools, has been especially useful in the maintenance operations which are carried on with State forces, differing in this respect from construction which is largely conducted on a contract basis. When the war equipment was first offered, a number of the States were insufficiently equipped to carry on this essential work. In such States the material received from the Government was used to make timely repairs to highways which otherwise probably would have deteriorated for lack of the necessary maintenance equipment.

The surplus explosives have been usefully employed in road construction and, by farmers, in the clearing and drainage of agricultural land. Converted into forms suitable for agricultural purposes, various war explosives of an estimated value of $9,500,000 have been supplied at cost in carload lots to State agricultural colleges and other distributing agencies, and by these have been sold to farmers at prices considerably below the market price.

Highway Research

The highway research carried on by the Bureau of Public Roads is designed to promote economy in design and construction and to improve the service value of the highways. Of special importance in the work of the past year have been the studies of the possibility of reducing the effects of motor-truck impact by changes in the spring, wheel, and tire equipment of vehicles, and by refinements in the surface finish of roads.

THE FOREST SITUATION

The forest situation in the United States remains critical. Gradual gains in forest protection and in timber growing on privately owned land are being made, but our forest products are still obtained largely through timber mining, not through practices which insure replacement. The idle-land evil is probably extending, though at a decreasing rate. One by one industrial units operating on virgin stumpage in the Lake States and the South come to the end of their raw material, and vanish; and often the lumbering of second-growth timber is still merely a prolongation of the process of depletion.

This, however, is not a complete picture. It sets forth only the dark side, a side which needs to be frankly recognized. To assume that the country's forest problem is virtually solved and that it will work itself out shortly as a matter of industrial evolution would be a serious mistake. The situation demands a larger program of public action than has yet been entered upon. Yet there are excellent reasons for optimism.

The forest situation in the West is, on the whole, in better shape than in the East. Primarily that is because so much of the western timber is in national forests. They contain one-third of the saw timber and almost two-thirds of the forest land. Other forms of public ownership raise the total acreage so owned to 72 per cent.

For the entire country, on the other hand, 4 acres out of every 5 are privately owned. With so large a part of the western forest land in public ownership, and with the certainty that most of the present Federal and State timberlands will continue to be held as permanent public properties, the West should never have to face a problem of forest restoration as acute as that now confronting the East.

The greatest obstacle to more rapid progress in forestry in the West is the fact that altogether too much mature timber is seeking a market through manufacture. The immense volume of stumpage in private hands creates a pressure to liquidate which makes the underlying economic condition of the lumber industry in that region unstable. What is needed more than any other one thing in practically all parts of the West is relief from this pressure.

National Forest Timber Sales

The presence of the national forests, of course, makes this pressure materially less than it otherwise would be. Were the publicly owned timber of the West private property, orderly marketing would be incomparably more difficult, waste far greater, and the prospect of rational forest land use much more distant. The national forests also serve as proving grounds of practices necessary for timber growing and thus exert a powerful educational influence on the lumber industry.

It is objected, however, that selling western national-forest timber even in the present moderate quantities tends to increase market instability. In comparison with the total cut, that derived from the national forests is insignificant. Although they contain one-fourth of the standing timber in the United States they furnish but 2 per cent of the total lumber cut, and in Oregon and Washington less than 3½ per cent of the cut. Stumpage prices are not put low to attract purchase but are maintained at a fair level and subjected to competitive bids. Virtually all the timber sold goes either to meet the needs of a local public dependent upon neighboring national forest lands for their supplies, or to maintain local industries already established, or to help the economic development of regions which would be held back without offerings of national-forest stumpage, or to prevent the waste of timber through its decadence, or through failure to dispose of it when intermixed private timber is being cut. The policy of utilizing national-forest timber is conservative, and it should not augment the current tendency toward overcutting in the West.

The total cut from the national forests last year, both for lumber production and for poles, ties, mine timbers, pulp wood, piling, fencing, fuel, and like uses, was the equivalent of 1,170,000,000 board feet under sales, 88,000,000 board feet under free use, and 83,000,000 board feet under agreements for the exchange of timber for private land within the forest boundaries. At the current rate of cutting

for all these purposes some 400 years would be required to harvest the present stands of merchantable timber in the national forests.

Further Needs for Public Action

In recognition of the obstacle to the investment of private capital in timber growing which a long period of carrying charges on young forests sets up, California enacted and Oregon considered legislation designed to protect young growth from overheavy taxation. There can be no question of the need for finding more rational and equitable methods of taxing lands devoted to timber growing than the methods now prevailing in most States. Since the situation in the Northwest is a difficult one for timberland owners and for progress in forestry, the study of the tax problem inaugurated by this department under authority of the Clarke-McNary law will be extended into that region during the present fiscal year. While in the main the fundamental economic conditions created by the large supply of private timber awaiting manufacture in the Northwest, as against the absorptive capacity of present markets, will have to work themselves out, it is sound public policy to adopt any reasonable measures that will hasten the process of adjustment and increase the feasibility of private timber growing. Reforestation on a substantial scale has already been undertaken by industrial interests in several portions of the West. With the adjustments in taxation and industrial organization that are feasible, there are strong reasons for confidence that the West will make the transition from the exploitation of virgin forests to timber growing without having to pass through a stage of depletion like that which now exists in the East.

But the West contains only one-fourth of the forest land in the United States, and although it now has three-fifths of the saw timber in the entire country, even under intensive forest culture it can not permanently produce much if any more than one-fourth of the present annual drain on our forests. Further, in course of time it will itself consume most of what it grows. The East consumes three and one-half times as much lumber as the West. It has approximately five-eighths as much standing saw timber. Less than 3½ per cent of its forest land is publicly owned. What are its prospects for timber growing?

Prospects for Timber Growing

In many ways they are decidedly encouraging. Public realization of the importance of the forest problem and interest in its solution are more marked than ever before; State forestry, including the promotion of timber planting, shows rapid progress; municipal forests are being extended; there has been a substantial enlargement of organized fire protection and advancing efficiency in protection efforts; and there is taking place a gradual expansion of farm forestry and industrial forestry, and a steadily growing interest on the part of landowners in the economic possibilities of timber crops. On the other hand, private owners are still uncertain whether timber growing can be made profitable, partly because of high fire hazards and the danger of higher taxes than this form of land use can support; insufficient knowledge, both silvicultural and economic, is avail-

able for their guidance; there is lacking adequate means for acquainting private owners with the best practices that have been worked out, and with the benefits obtainable through their use; and there has been very meager development of eastern public forestry in the form of Federal and State forests, to point the way to private owners and to bring under management the considerable areas for which public ownership is distinctly required.

Forestry in the South

The progress that the Southern States have made in public provision for forestry has been unequaled in any other region during the last five years. Since 1923 six States have inaugurated forestry work, and the only one which still remains without any provision for it is Arkansas. Including Missouri in the group of Southern States 13 are now cooperating with the Federal Government in protecting their forest lands against fire. The interest of southern timberland owners in the possibilities of forest production is becoming widespread; a considerable number of them are already engaged in it. The South has great advantages for continuous timber production and likewise very great need for it as a means of maintaining industry, increasing wealth, and keeping land in use. Yet public activities to promote timber growing will have to be enlarged if the transition to wise land use for this purpose is not be regrettably delayed.

In both the Appalachians and the Ozarks the bulk of the timberland is in large private holdings, chiefly of lumber, pulp and paper, and other industrial enterprises, or of individual lumbermen. Federal land purchases to build up national forests in the Appalachians and the Ouachita and Ozark National Forests established in Arkansas by withdrawing public lands for this purpose have extended public administration to a limited part of the total area; forest protection under State leadership is steadily gaining ground; and industrial forestry is being undertaken on the holdings of a few companies. The State of Pennsylvania has purchased more than 1,100,000 acres of her mountain lands and is putting them under administration as State forests. North Carolina and Tennessee are joining in an effort to acquire and donate to the Federal Government 700,000 acres in the Great Smokies to be administered as a national park. There is every reason why many of the Southern States should have large State forests covering their more rugged portions.

"Piney Woods" Country

The "Piney woods" country of the South presents very different conditions. From eastern Maryland to eastern Texas the Coastal Plain contains a large percentage of forest land. This southern pine belt comprises more than 100,000,000 acres which will probably be put to its best use through timber growing rather than agriculture. Most of the original pine has been cut. It has contributed enormously to the economic life of the South, and the forced cessation of its lumbering will be a severe blow to the region. In spite of the inveterate southern custom of woods burning, enough second growth has sprung up and reached merchantable size to prolong

somewhat the southern pine-lumber and naval-stores industries. But only the general practice of timber growing will make them permanent on an extensive scale.

The southern pinelands, however, have another possible form of use. Grass often covers the cut-over lands with an apparently luxuriant forage crop. Stock raising is general, and the prevalence of forest fires has been due first of all to the belief that it improves the pasturage. Far too little is known regarding the best methods of livestock production in the South. There is no adequate knowledge of how far it will be practicable and advantageous to combine timber growing and grazing under improved methods, or where one or the other will constitute the more profitable use. Fires, grazing, and timber reproduction are bound together in a difficult problem of land management. And in addition the question enters as to where and to what extent the cut-over pinelands might better be devoted to agriculture than to forest use or pasturage. Thus the problem of forestry in the pine country of the South brings into view many matters that must be subjects of research. The time is ripe for rapid change, and with suitable public leadership, assistance, and education timber growing will surely work into the place in southern land use that its prospective returns justify.

Joint Program for Southern Forestry

Concretely, the States of the South and the Federal Government should share in a program jointly devised to obtain adequate protection of all forest lands against fire, to provide the research necessary to the best land use, to pass on the knowledge yielded by research to those able to profit by applying it, to locate public forests of sufficient number and extent to exercise a powerful stimulating influence on private forestry, and to devise and enact enlightened, economically sound laws with respect to forest taxation.

Pulp and Paper Industry in Alaska

A notable development of the year in national-forest administration was the initiation of two projects for the utilization of pulp timber in Alaska—by far the largest sales of Government timber that have ever been made. There are two national forests in the Territory, both on the coast. The larger and more southerly is the Tongass. It is here that the pulp-timber areas covered by the present sales are located. Together they embrace more than 8,000,000 cords of pulpwood stumpage. The Tongass has all told about 120,000,000 cords of such stumpage, and its estimated permanent growth or continuous yield of pulpwood is at least 1,000,000 cords annually. This would permit an output for all time of not less than 1,000,000 tons of newsprint paper a year, or one-fourth the present consumption of the entire United States. The sales now under way contemplate an output within five years of 120,000 tons annually.

The entrance of the pulp and paper industry into the Alaskan region will be of almost immeasurable importance to the Territory. A capital investment of at least $8,000,000 or $10,000,000 will be necessary in connection with each of the two projects now inaugu-

rated. Part of this investment will be for the development of water power. The power sites, like the timber, are public property, and in consequence a coordinated development of both resources in the best interest of the Territory is made possible. The Federal Water Power Commission and this department are pursuing a joint policy under which pulp-wood areas and the water power necessary to make their operation feasible are blocked up together and made available to the same manufacturer, after advertisement and competitive bidding.

The consummation of these two sales will write the end of a long chapter in the history of the effort to make conservation a means for promoting the sound development and permanent prosperity of Alaska. For a good many years there was widespread misunderstanding of the aims and methods proposed, and natural doubt in Alaska of the outcome. Many believed that the Territory was being strangled under a locking up of its natural resources. The contrary was true. Private acquisition of the timber and water-power resources of the Tongass National Forest would have been chiefly for speculative profits.

Permanent Development in Alaska

The national-forest timber has always been open to sale on liberal terms to any purchaser wishing to use it, and has been sold in increasing and substantial quantities. It is the sole support of a flourishing local lumber industry and afforded a cut last year for all purposes equivalent to more than 50,000,000 board feet, log scale. At the same time the Forest Service has energetically sought to interest outside capital in the possibilities of pulp and paper production. The long effort has now apparently succeeded. Unlike any other heavily timbered region of the United States, the Alaskan coast will not become the scene of temporary exploitation leading to timber depletion, but can look forward to the development of permanent forest industries in keeping with the capacity of the forest lands to sustain them.

National-Forest Idle Land

In my report of last year I called attention to the large areas of burned-over land on the national forests needing to be planted in order to restore them to productivity. While in the main these nonreforesting burns are a heritage from long ago, each bad fire season such as that of 1926 adds new areas. Through the acquisition of cut-over lands to build up eastern forests the need for planting to make all the land productive is further increased.

The present appropriation for national-forest tree nurseries and planting is too small to make an appreciable impression on the 2,000,000 acres of idle land within the forests. Not to get tree crops started on this land is bad economy from every standpoint. The land adds to the public cost of administration without a counterbalancing prospect of future timber. To urge reforestation for private owners while allowing the Federal properties to remain with considerable areas bare of valuable tree growth, though its restoration at a moderate outlay is entirely feasible and would con-

stitute a prudent investment of public funds, is lacking in consistency. This work should be enlarged at the earliest possible time.

National-Forest Grazing Fees

The proper basis on which to determine the fees charged for grazing livestock on the national forests has been under discussion between the department and the stockmen for some years. After a painstaking appraisal of the 30,000 odd grazing allotments, extending over four years, the Forest Service proposed a new scale of fees based primarily upon what is being paid for the use of similar private range. This involved a considerable increase of the fees in most national-forest regions, which many stockmen vigorously opposed.

To obtain an independent and impartial review of all the questions at issue, I obtained the assistance of Dan B. Casement, an experienced and entirely disinterested western stockman, who after six months of painstaking inquiry submitted a report approving the range appraisal methods developed by the Forest Service and the principles underlying the fees proposed. Mr. Casement recommended, however, some changes in the scale of fees proposed, to harmonize them more fully throughout the various regions, and certain reductions to bring the principle of commercial valuation into better balance with the social and economic benefits sought in the administration of the national forests. Mr. Casement's report, in which the Chief of the Forest Service concurred, was then submitted to the livestock men for their study and consideration.

Early in January, 1927, I met with the stockmen in conference in Salt Lake City. After two full days' discussion, I approved the schedule of fees originally developed by the Forest Service, as modified by Mr. Casement's recommendations, with such further modifications as might be found equitable to adjust all fees fairly between the different national forests and regions. The new scale of fees will be put into effect, where increases are called for, through graduated annual increases for four years beginning January 1, 1928. The final fees will be fully in effect on and after January 1, 1931. Since the present term permits expire in 1935, I informed the stockmen that no changes in grazing fees for the ensuing 10-year period would be made unless the basic conditions had materially altered by that time.

Adjustment of Charges

One of the important features of the new schedule of grazing fees is to adjust the charges more specifically to the value of each range allotment, in lieu of the flat regional rates largely applied heretofore. Hence there will be considerable diversity in the individual fees. Averaging all grazing allotments, however, the effect of the change will be to raise the present average rate for cattle from 10.4 cents to approximately 14.4 cents per month, and the average rate for sheep from 2.9 to 4.5 cents. No charge is made for livestock of either class under 6 months of age.

The decision has been accepted in good part by at least most of the livestock permittees. Range and business conditions in the livestock industry have improved materially; and the advantages of the

greater stabilization of range use on the national forests under the 10-year permit system are becoming more and more evident.

Home Economics

The Bureau of Home Economics is the national agency for collection and distribution of data on food composition. These data are not only necessary for all studies in human nutrition but are basic terms in the application of principles of nutrition in everyday menus and corrective diets. During the last year all available figures on the composition of retail cuts of beef, veal, and lamb, and the more usual fruits and vegetables, have been analyzed and prepared for publication.

Accumulated facts on American food habits show that the average farm family is much better fed than the average city family of the same income level. The food contributed from the farm to family living adds considerably to the income of the family on the farm. Studies on methods of keeping accounts have resulted in the preparation of an account book based on the forms found most useful by the women cooperating in this study. A number of women are keeping accounts which will be used as the bases for suggested household budgets.

Long-continued time studies with housewives are furnishing a very good picture of how the rural housewife is spending her time. In lightening her load, electric equipment is of great value and is becoming increasingly available. Studies have been inaugurated to show which kinds of electrical equipment will be of most value to her, and which may be operated most economically.

The Bureau of Home Economics has been called upon by other bureaus to cooperate in studies having to do with utilization of various food products. Meat studies have been made to determine the influence of production factors on palatability. Cooking tests have been started on the domestic almond to determine what changes are necessary in the methods applied to foreign almonds in order to yield the most satisfactory product Advice has also been furnished to different cooperative organizations in regard to the form in which the housewives can utilize their products to the best advantage and at the same time decrease certain of the marketing costs. The organization of cooperative marketing makes possible better control of marketing methods, as well as the adaptation of production to the amount the market can absorb.

THE GRAIN FUTURES ADMINISTRATION

In connection with the enforcement of the grain futures act and the supervision of transactions in futures on the 12 exchanges designated as contract markets, daily reports were received from all clearing members showing the volume of trading for customers, together with the changes in open commitments from day to day. During the fiscal year the total volume of trading in grain for future delivery on all contract markets aggregated 19,964,384,000 bushels against 24,604,867,000 bushels during the previous year. Of the total trading in all grains, 12,584,391,000 bushels, or 63 per cent, represented trading in wheat futures in comparison with 18,344,839,000 bushels, or 74½ per cent, for the year preceding.

The transactions in wheat futures on the Chicago Board of Trade aggregated 10,619,503,000 bushels, or a little more than 84 per cent of the total trading in wheat on all markets, against 15,869,030,000 bushels, or 86½ per cent the previous year. The total volume of trading in wheat was considerably smaller during the past year, and the daily price fluctuations were less pronounced. During the first half of the crop year, when the greater portion of the wheat was being marketed, the average daily price range of the dominant futures at Chicago was only 1⅞ cents as compared with an average daily range of 3⅜ cents for the corresponding period as applied to the 1925 crop.

Early in the year the New York Produce Exchange was designated as a contract market under authority contained in the grain futures act. The trading in wheat futures on the New York Produce Exchange was started on August 2, 1926, and was applied to both domestic and bonded wheat. It is the only market east of Chicago trading in grain futures and while the volume of trading has not been large it gives promise of becoming a factor of no little importance through the affording of suitable hedging facilities in connection with the heavy export movement of grain through the port of New York.

RECENT FEDERAL LEGISLATION

Among the acts passed at the last session of Congress was a measure (S. 4746) authorizing the Secretary of Agriculture to collect and publish statistics of the grade and staple length of cotton covering both the current crop and the carryover, and limiting to five the number of reports to be issued on the condition, progress, and probable number of bales of the current crop. Another act passed affecting cotton (S. 4974) amended the cotton futures act by providing that differences above or below middling in future contracts shall in all cases be settled on the basis of the average commercial difference of not less than five of the bona fide spot markets designated by the Secretary of Agriculture for this purpose. An act was also passed (S. 2965) prohibiting boards of trade or similar organizations from excluding from their membership and privileges representatives of cooperative associations or producers' organizations acting for a group of such associations.

The last Congress also added to the regulatory laws administered by the department the act of February 15, 1927, to regulate the importation of milk and cream into the United States; the act of March 4, 1927, to safeguard the distribution and sale of certain dangerous caustic or corrosive acids, alkalies, and other substances in interstate and foreign commerce; and the act of March 3, 1927, to prevent the distribution or dumping, without good and sufficient cause therefor, of farm produce received in interstate commerce by commission merchants and others and to require them truly and correctly to account for all farm produce received by them. Aid was rendered the administrative officials of the department in formulating the regulations required by these three acts, and one of the assistants in this office participated in hearings held in Boston and New York on the milk-importation regulations.

Weeks Forestry Law

The National Forest Reservation Commission, at its two meetings held during the year, authorized the purchase by the department of a total of 135,000 acres in 12 States. During the year there were prepared, executed, and approved 200 agreements of purchase for the acquisition of lands covered by authorizations of the commission; and titles to lands in excess of 365,000 acres were examined, 178,512 acres of which have been acquired by the United States. Approximately 52,000 acres of land, titles to which have been examined, are now in condemnation, and 135,000 additional acres are in process of acquisition. The amendment of the Weeks forestry law so as to permit payment of awards in condemnation cases, upon the approval of the proceedings by the Attorney General, has materially expedited the handling of condemnation cases.

OFFICE OF INFORMATION

The Office of Information has continued to utilize three channels—department publications, the press, and radio broadcasting—in disseminating the results of scientific studies.

During the year congressional and miscellaneous demands called for the distribution of 27,877,340 copies of the department's various publications. Included in this figure are all classes of bulletins, circulars, periodicals, and other publications of an informational nature. There were printed during the year a total of 28,871,920 copies of department publications.

Farmers' Bulletins are the most popular of the several types of publications issued by the department. Of the 11,360,952 of these distributed, 7,841,328 were sent out by Senators or Representatives in Congress, and 3,519,624 in response to requests sent to the Office of Information.

A new series called Department Leaflets was started. These publications are confined to practical directions and recommendations in regard to specific remedies or methods. They are written in an informal, popular style and are limited to four or eight pages of text matter and illustrations. It is believed that this series will accomplish a marked saving in the cost of making available to hundreds of thousands of persons the department's vast amount of information.

It was decided to discontinue the Department Bulletin series with No. 1500 and to replace it with a series called Technical Bulletins. Department Circulars were discontinued with No. 425 and replaced by Circulars. The name of the Miscellaneous Circular series was changed with No. 110 to Miscellaneous Publications. The changes were made in the interest of greater clearness and definiteness. Each new series began with No. 1.

After several years of issuance in multigraph form, the Agricultural Situation, issued monthly, was changed to a printed publication carrying the same general type of economic information. This change was made in order to provide for a wider distribution of this type of information than was possible in multigraph form. In the printed form it is available to anyone interested at the subscription price of 25 cents per year.

The Forest Worker, another publication issued in mimeograph form, was changed to a printed form, so that the information it contained could be made available to all who care to subscribe for it. The subscription price is 25 cents per year.

The weekly issue of Crops and Markets was discontinued on December 31, 1926. With this change there was some expansion in the size of the monthly issue, and arrangements were made for issuing in mimeograph form the important market reports formerly given in the weekly issue.

The Press Service

A healthy interest in the welfare of agriculture is reflected in the increasing attention given to the industry in the press. Daily newspapers are devoting more space to agriculture—particularly to developments in the scientific and economic fields. In this use of agricultural information the department is a willing cooperator.

Information of news interest and of educational value originating in the department is made available to the press through the department's press service in the Office of Information. "Spot news" is given immediate distribution to all national press associations and to some 200 press representatives in Washington. In addition it is mailed in mimeographed form to all presumably interested publications. Other information, such as that relating to the general agricultural situation, new developments in research, regulatory measures, or extension projects, as well as reviews of department bulletins, is mimeographed and given wide but selected and classified distribution.

Daily, weekly, and semiweekly newspapers, farm journals, trade and technical magazines and miscellaneous publications, of which there are more than 22,200 in the United States, are reached either directly or indirectly in this way, with the result that this agricultural information ultimately reaches millions of readers. Mimeographed releases of this kind averaged between four and five a day, or totaled more than 1,200 in the last year. Many special articles also were written for limited or exclusive use.

Still another outlet for information is the printed weekly Clip Sheet which goes to all weekly and semiweekly newspapers, and to other publications serving a large circulation. It contains short stories of timely interest and educational value. Another service inaugurated last year for country weeklies and mimeographed under the title "Page, Line, and Paragraph" is so much in demand that its distribution has been extended recently to include county-seat weeklies and semiweeklies. It now goes to some 10,600 papers of this class, all of which serve a large rural circulation. It consists of seasonal and useful information on agricultural practices and home making.

Representatives of the press, free-lance writers, and other contributors to publications using agricultural matter, are encouraged to call at the press service headquarters for suggestions for special articles. Assistance is given them in obtaining subject material and illustrations for featuring such special articles, a service which results in the publication of much valuable agricultural matter.

The Radio Service

One of the projects carried out by the department's radio service in its first full year of broadcasting a comprehensive technical information service, was an inquiry into the use of this service, and of radios in general, by farmers. During the 1926–27 season, the radio service sent 10,000 questionnaires to individual farmers, county agricultural agents, and managers of broadcasting stations. The replies are incorporated in a report, The Number and Uses of Radio Sets on Farms in the United States, April 1, 1927. On April 1, 1927, there were 1,251,186 radios on farms in the United States, an increase of 128 per cent over the number on farms July, 1925.

The report was used as a guide in planning the radio programs. This season's programs include three of last year's favorites: Aunt Sammy's daily housekeepers' chat, the noontime farm flashes, and the United States radio farm school, as well as eight special features. The special features for 1927–28 are: The poultry chats, a new program worked out in answer to numerous requests for a special poultry program; the young folks' program; insect and wild-animal allies and enemies; primer for town farmers; the farm news digest; and chats by the weather man. Two new special monthly programs are scheduled: The agricultural situation review; and special monthly farm playlets dramatizing agricultural problems.

The services are well received by broadcasting stations. More than 100 commercial stations were broadcasting the department's programs in October. Hundreds of letters received from farmers cite instances of how these programs are put to use. Farmers report increased profits through improved marketing practices learned in farm radio lessons. More cotton on fewer acres, better food in the home, and better crops at lower cultivation costs, are listed among the benefits received. Thousands of individual requests have been received for literature mentioned in the services. Fifty thousand free copies of Aunt Sammy's Radio Recipes and 165,219 free Farm School pamphlets have been issued.

LIBRARY

The resources of the library of the department have been increased during the past year by the addition of 14,168 books, pamphlets, and bound periodicals and by the current issues of approximately 3,400 periodicals. As in previous years, more than half of these were received by gift or in exchange for department publications. The library is particularly rich in its collections of periodicals and official and society publications. Exchanges are received from every State in the Union, from our neighbors on the north and south of us, from the British Isles, from all the countries of Europe, from Asia, from Australia, from the islands of the Pacific, in fact from every civilized country. These books, periodicals, bulletins, and reports are invaluable sources of information on the subjects under investigation by the department.

Three additions were made during the year to the mimeographed series of Bibliographical Contributions of the library, namely, No. 12, entitled "Peat: A Contribution towards a Bibliography of the American Literature through 1925"; No. 13, entitled "A Classified

List of the Soil Publications of the United States and Canada"; and No. 14, entitled "List of the Publications on Soils Issued by the United States Department of Agriculture, 1844–1926." The last two were specially prepared for distribution at the First International Congress of Soil Science held in Washington, June 13–22, 1927. In the Bureau of Agricultural Economics library the following additions were made to the mimeographed series of Agricultural Economics Bibliographies: No. 17, "Farm Youth: A Selected List of References to Literature Issued Since January, 1920"; No. 18, "Price Fixing by Governments, 424 B. C.–1926 A. D.," "A Selected Bibliography, including some References on the Principles of Price Fixing and on Price Fixing by Private Organizations"; No. 19, "The Apple Industry in the United States: A Selected List of References on the Economic Aspects of the Industry."

PERSONNEL OF THE DEPARTMENT

On June 30, 1927, the department had on its rolls 21,661 employees, of whom 4,791 were located in Washington and 16,870 stationed in the field service. This number is an increase over the employees on June 30, 1926, of 84 in Washington and 835 in the field service.

The expansion of certain activities for which increased appropriations were provided by Congress, and additional duties required of the department by legislation were responsible for the additional personnel employed, more than one-half of which was required for the enforcement of the European corn-borer control act. As noted in my last report, the employment situation in the department is becoming more stabilized, as shown by the decrease in the turnover in the personnel from 11.41 per cent in 1926 to 10.69 per cent in 1927. In the Washington force about 60 per cent of the total turnover occurred in the first three grades in the clerical and custodial services.

During the year 59 employees were retired from the service, 30 due to age and 29 on account of disability. In 1926 the retirements were 16 due to age and 16 on account of disability. This increase seems largely due to greater readiness on the part of employees whose usefulness has been impaired by age or infirmity to avail themselves of the increased annuity recently provided under the retirement act.

Many employees have received advancement through promotion to higher grades involving more exacting duties. In a reasonable number of cases moderate increases in compensation have been granted, in recognition of competent and efficient service. Since there are practical limits beyond which compensation can not reasonably be increased without the assumption of new duties and added responsibilities, employees have been encouraged to fit themselves for further advancement by pursuing educational courses or by broadening their knowledge of the technical details of departmental work.

W. M. Jardine,
Secretary of Agriculture.

FINANCIAL STATEMENT

Expenditures, Department of Agriculture, Fiscal Year 1927

Funds expended and obligated for work under the supervision of the Department of Agriculture for the fiscal year which ended June 30, 1927, including road building, totaled $153,049,018.04, classified as follows:

(1) *Regular work*

For "regular work," or activities for which the department is directly and independently responsible, as follows:	
Office of the Secretary	$1,099,604.49
Office of Information	1,097,838.48
Library	83,490.08
Office of Experiment Stations	344,090.88
Extension Service	1,579,951.35
Weather Bureau	2,598,192.04
Bureau of Animal Industry	[1] 12,405,536.86
Packers and Stockyards Administration	403,786.96
Bureau of Dairy Industry	518,308.18
Bureau of Plant Industry	3,804,661.27
Forest Service	10,522,303.61
Bureau of Chemistry	1,464,364.93
Bureau of Soils (including Fixed Nitrogen Research Laboratory)	591,981.44
Bureau of Entomology	2,656,425.57
Bureau of Biological Survey	947,700.16
Bureau of Public Roads	448,958.90
Bureau of Agricultural Economics	5,014,293.94
Bureau of Home Economics	126,890.89
Insecticide and Fungicide Board	189,171.44
Federal Horticultural Board	774,290.75
Grain Futures Administration	101,693.87
Farmers' seed grain loans	264,425.53
Total expenditures for regular work	47,037,961.12

(2) *Other than regular work*

For work administered by department, supported by Federal funds provided as direct aid to States or for special forestry and wild-life conservation work and similar objects, as follows:		
(a) **Special conservation—**		
Cooperation with States in fire protection of forested watersheds of navigable streams	$704,224.24	
Cooperation with States in farm forestry extension and distribution of forest planting stock	116,436.25	
Acquisition of lands for protection of forested watersheds of navigable streams	1,001,290.79	
Acquisition of land for upper Mississippi River wild life and fish refuge	88,031.27	$1,909,982.55
(b) **Colleges and stations—**		
Payments to State agricultural experiment stations for research work under Hatch, Adams, and Purnell Acts	2,880,000.00	
Payments to State agricultural colleges for extension work in agriculture and home economics under Smith-Lever Act	5,880,000.00	8,760,000.00

[1] Including $3,605,000 paid to livestock owners as indemnities for animals destroyed in connection with tuberculosis eradication, and $5,034,810.07 for meat-inspection service.

For work administered by department, supported by Federal funds provided as direct aid to States or for special forestry and wild-life conservation work and similar objects—Continued.

(c) Forest Service receipt funds—		
Payments to States for benefit of county roads and schools (national-forest receipts)	$1,299,090.69	
Roads and trails for States (national-forest receipts)	447,852.80	
Cooperative work, consisting principally of forest road and trail construction, also improvements, fire prevention and suppression, disposal of brush in timber-sale operations, and investigative work (paid from private contributions)	1,461,167.15	
Refunds to users of national-forest resources of moneys deposited by them in excess of amounts required to secure purchase price of timber, use of lands, etc	60,396.91	
		$3,268,507.55
(d) Road construction—		
Federal-aid highways—		
Payments to State highway departments for road construction	82,698,559.70	
Highway research and investigational studies	279,006.25	
	82,977,565.95	
Forest roads and trails	9,095,000.87	
		92,072,566.82
Total expenditures for other than regular work		$106,011,056.92
Total expenditures for all purposes		153,049,018.04

Expenditures for Regular Work

(1) *Net cost of work*

As indicated by the foregoing table, total expenditures during the fiscal year 1927 for what may be designated as the "regular work" of the department (as distinguished from work supported by Federal funds administered by the Department of Agriculture but made available for direct use by the States or for special conservation purposes), were $47,037,961.12. Partially offsetting this amount, earnings in connection with these activities during the year, aggregating $5,687,412.05, deposited in the Treasury of the United States to the credit of "miscellaneous receipts," and $182,818.79 received as fees for classifying cotton and credited to the revolving fund for that purpose, make the actual net cost to the Federal Government of the department's regular work $41,167,730.28.

(2) *Distribution by types of activity*

The total expenditure of $47,000,000 for regular work was distributed by types of activity approximately as follows.

Types of activity	Amount	Per cent
(a) **Research** (including investigations and experiments in animal and plant production, breeding, and improvement, in methods of controlling diseases, insects, and other animal and plant pests, for soil and fertilizer studies, for farm management practice, marketing, and crop utilization investigations, and other scientific studies and investigations of the fundamental problems of agriculture, horticulture, forestry, etc., by means of laboratory and field experiments)	$10,600,000	22.6
(b) **Extension work** (demonstration and educational work by means of county agricultural, home demonstration, and boys' and girls' club agents, through exhibits, motion pictures, or otherwise, with a view to the dissemination, by direct contact of the information developed by the experiments and discoveries, of the department and the various States)	2,400,000	5.1
(c) **Eradication or control** (direct control or eradication of plant and animal diseases, insects, and other pests, through organized campaigns, either independently or in cooperation with State agencies)	9,000,000	19.1
(d) **Service work** (including such activities as the administration and protection of the national forests, the weather service, crop and livestock estimating, market news service, shipping-point and terminal-market inspection service on farm products, and other work of like character for the benefit of the public, not primarily involving research or the enforcement of special laws of a regulatory nature)	15,000,000	31.9
(e) **Regulatory work** (administration of some 40 regulatory laws, such as the food and drugs act, meat inspection law, plant and animal quarantine acts, migratory-bird treaty act, cotton futures and cotton standards acts, grain standards act, warehouse act, etc.)	10,000,000	21.3
Total	47,000,000	100.0

Expenditures for all Purposes, Distributed by Types of Activity

The total expenditure of approximately $153,000,000 for the fiscal year 1927, covering all funds disbursed or administered by the department, was distributed by types of activity about as follows:

Items	Research	Extension	Eradication or control	Service activities
Regular work, or ordinary activities of department	$10,600,000	$2,400,000	$9,000,000	$15,000,000
Special forestry and wild-life conservation	[1] 35,000	[2] 45,000		[3] 1,820,000
Colleges and stations (payments to States under Hatch, Adams, Purnell, Smith-Lever, and supplemental acts)	[4] 2,880,000	[5] 5,880,000		
Forest Service receipt funds	[6] 35,000			[7] 3,225,000
Federal-aid and forest roads	[8] 280,000			
Grand total	13,830,000	8,325,000	9,000,000	20,045,000
Percentage of grand total	9.0	5.4	5.9	13.1

Items	Regulatory work	Road construction	Total: Amount	Total: Percentage of grand total
Regular work or ordinary activities of department	$10,000,000		$47,000,000	30.7
Special forestry and wild-life conservation			1,900,000	1.3
Colleges and stations (payments to States under Hatch, Adams, Purnell, Smith-Lever, and supplemental acts)			8,760,000	5.7
Forest Service receipt funds			3,260,000	2.2
Federal-aid and forest roads		$91,800,000	92,080,000	60.1
Grand total	10,000,000	91,800,000	153,000,000	100.0
Percentage of grand total	6.6	60.0	100.0	

[1] Forest taxation and timber insurance studies, under appropriation "Forest fire cooperation" (Clarke-McNary reforestation act).
[2] Cooperation with States in farm forestry extension work (Clarke-McNary reforestation act).
[3] Cooperation with States in forest fire protection and distribution of forest planting stock under Clarke-McNary reforestation act; purchase of forest lands, under Weeks forestry law; and purchase of lands for Upper Mississippi River Wild Life and Fish Refuge
[4] Payments to State agricultural experiment stations for research work under Hatch, Adams, and Purnell Acts.
[5] Payments to State agricultural colleges for extension work under Smith-Lever Act.
[6] Forest investigative work under appropriation "Cooperative work, Forest Service."
[7] Used principally for county road and school purposes in national-forest States.
[8] Highway research and investigational studies under appropriation for Federal-aid highways.

Income from Department's Activities, Fiscal Year 1927

Incident to the department's work during the fiscal year 1927 direct receipts totaling $8,509,673.29 were covered into the Treasury and fines were imposed and judgments recovered by the courts amounting to $111,554.03 in connection with the enforcement by the department of the regulatory laws which devolve upon it for administration and execution, as follows:

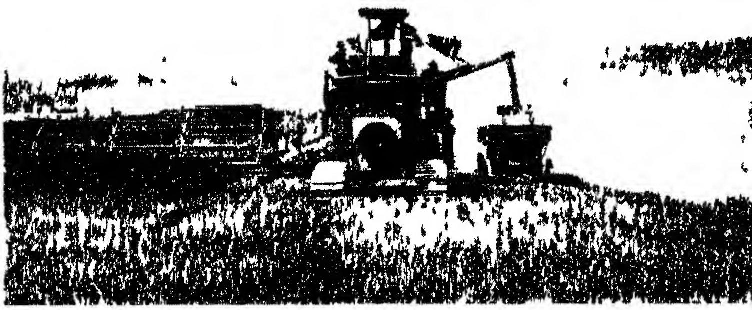
(1) *Receipts*

(*a*) Deposited to credit of miscellaneous receipts fund:			
Regular work—			
From business on the national forests	$4,652,565.06		
From other sources	1,034,846.99		
		$5,687,412.05	
Other than regular work—			
Ten per cent of net receipts from business on the national forests, appropriated as a special fund for forest road and trail construction in 1928	514,040.68		
Proceeds from sale of surplus war materials transferred to States for road-construction work	23,917.29		
Contributions from private cooperators, appropriated as a special fund for road and trail construction, fire protection and suppression, brush disposal, and investigative work on national-forest and privately owned lands	1,507,463.34		
		2,045,421.31	
Total deposited to credit of miscellaneous receipts fund			$7,732,833.36
(*b*) Deposited to credit of applicable funds of department:			
Fees collected for classifying cotton, deposited to credit of revolving fund for conducting this work		$182,818.79	
Reimbursement to various appropriations of department for expenditures made therefrom		594,021.14	
Total deposited to credit of funds of department			776,839.93
Total receipts			8,509,673.29

(2) *Fines*

Fines imposed and judgments recovered by the courts in connection with violations of statutes entrusted to Department of Agriculture for enforcement	111,554.03
Total direct income from activities of Department of Agriculture	8,621,227.32

WHAT'S NEW IN AGRICULTURE



ABACÁ Fiber Cleaning Machine Saves Work and Does Better Job

For more than a century the entire world supply of abacá or "manila hemp" fiber has been cleaned by a slow, laborious, and wasteful hand-stripping process. With the crude handmade implement that is used for this work (fig. 1) a man will ordinarily clean from 20 to 25 pounds of fiber in a day, and it is estimated that the average abacá "stripper" cleans less than 2 tons of fiber as a year's work. The labor of more than 75,000 men has been required to do the work that can now be done with 350 machines.

The disadvantages of cleaning abacá fiber by this antiquated method have not been limited to the unnecessary waste of labor. In the hand-stripping process there is loss of fiber both in the preliminary work of preparing the fiber ribbons and in the subsequent work of drawing these ribbons under the stripping knife, resulting in a total loss of about one-half the fiber in the stalk. As many different kinds of stripping knives are used, there has been no uniformity in the product, and it has been found necessary to establish more than 20 different commercial grades of abacá fiber. Large quantities of inferior fiber are produced by the hand-stripping process, and the annual production of "damaged" fiber, which is fiber of such poor quality that it can not be included in any of the recognized commercial grades, has amounted to nearly 25,000,000 pounds.

United States Consumption 150,000,000 Pounds

Abacá fiber is used principally for the manufacture of manila rope, and about 150,000,000 pounds of this fiber are consumed annually in the United States. The high production costs of abacá fiber, which are due largely to inefficient methods of cleaning, are reflected in the prices both of abacá fiber and of manila rope. During

the five-year period from 1922 to 1926 there was a decrease of more than 6,000 tons in the annual imports of abacá fiber into the United States, while our annual bill for abacá increased during this same period nearly $9,000,000.

It has long been recognized that, with increasing labor costs and growing competition from other cordage fibers, the hand-stripping method of cleaning abacá must eventually be replaced with a machine-cleaning process. During a period of at least 50 years repeated attempts have been made to perfect a machine for cleaning abacá. Machines of many different types have been constructed, only to be subsequently abandoned. The machine inventors, in most instances, have attempted to construct a small machine that could be moved from place to place in the abacá fields and to devise a cleaning process that would be only a modified form of hand stripping.

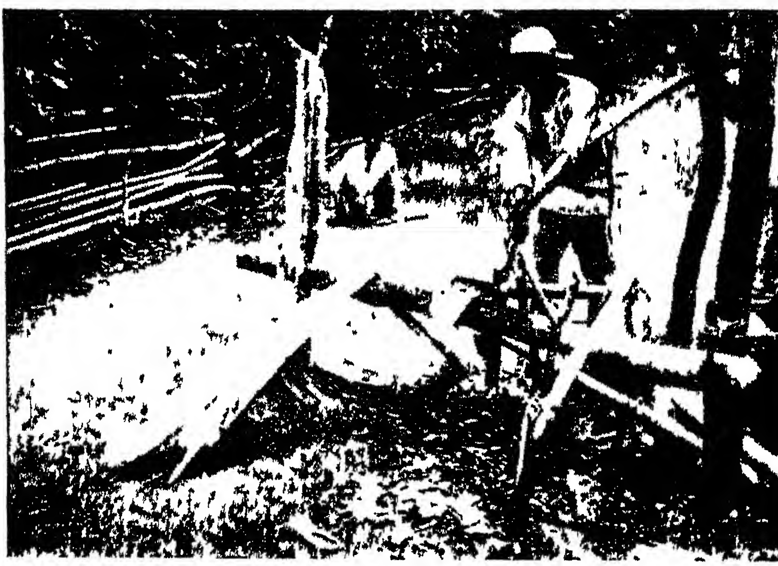


FIG. 1.—Stripping abacá fiber by hand in the Philippine Islands. A ribbon or "tuxie" is pulled under a finely serrated knife, scraping away the pulp

It now appears probable that large, permanently installed machines will be used for cleaning abacá fiber and that the stripping will be replaced by a beating process similar to that used for cleaning sisal fiber.

During the early part of 1924 the United States Department of Agriculture conducted experiments in the Province of Cebu, in the Philippine Islands, to determine if abacá can be cleaned with the same machines that are used for cleaning sisal fiber. Twenty abacá stalks were brought from a plantation in the interior of the island to the coast town of Sibonga, where a sisal machine was located, and these stalks were cleaned with this machine. The fiber obtained in this first test was of inferior quality, but it was demonstrated that the machine would clean abacá. The results obtained indicated that with certain changes in adjustment it would be possible to clean a satisfactory quality of fiber with this machine.

Tests Made in Mactan Island

The data obtained in this experiment were furnished the agents for the machine, who made arrangements for conducting a more comprehensive series of tests with another machine of the same type that was located on the island of Mactan. One thousand stalks of abacá were brought to this island from several different Provinces, and a series of experimental cleaning tests were made. Careful records were kept of this work, and the machine-cleaned fiber was sent to a cordage mill in the United States for mill tests. The results obtained in these experiments were so promising that early in 1925 this machine was moved to the Province of Davao, in the island of Mindanao, where it was installed on an abacá plantation. The experimental work was continued at this place until it had been fully demonstrated that this machine could be economically operated in a commercial way on an abacá plantation. During 1926 one of the

FIG. 2.—Mill for cleaning abacá. The fiber-cleaning machine is mounted on the second floor to facilitate the removal of the bagasse, which comprises more than 95 per cent of the raw material

largest abacá plantation companies in the Philippine Islands purchased and installed on its plantation one of these machines, which has since been in regular operation. (Fig. 2.)

While this work has been in progress in the Philippine Islands, a plantation company in Sumatra has developed another abacá-cleaning machine. The Sumatra machines are of the same general type as those that are being used in the Philippines, and machine-cleaned abacá of good quality is now being produced in commercial quantities both in the Philippine Islands and in Sumatra

Advantages of Machine Method

The more important advantages in the use of these large machines for cleaning abacá fiber are the reduction in the labor required, the increase in the quantity of fiber obtained from a given quantity of raw material, and the production of a fiber of uniform quality. The use of large, automatic machines for cleaning abacá fiber will

entirely eliminate the preliminary work of preparing the fiber ribbons, which requires as much labor as the actual work of stripping; it will eliminate at least 50 per cent of the waste of fiber; and it will greatly simplify the present complicated system of grading abacá fiber.

The pioneer work with abacá-cleaning machines has been done, but there still remain a number of problems to be solved. Improvements can undoubtedly be made in the machine itself, and the methods of drying and brushing the fiber are yet to be perfected. The change from the old hand-cleaning methods to the new system of machine cleaning will require an almost complete reorganization of the abacá industry. This will be a difficult work and one that can not be accomplished in a short period of time. It is a change that must be made, however, if the Philippine Islands are to compete successfully with other countries in the production of abacá fiber.

H. T. Edwards.

ALFALFA of Ladak Variety is Promising for Northern States Ladak is the name that has been given to a promising new variety of alfalfa that was introduced from the Province of Ladakh in northern India. In 1910 a small packet of seed of this alfalfa was received through the Office of Foreign Plant Introduction under S. P. I. No. 26927. In 1911 four additional packets were procured from the same source under S. P. I. Nos. 30433, 30434, 30435, and 30436. All five lots were labeled *Medicago falcata* but proved to be hybrids between the yellow-flowered species, *M. falcata*, and the purple-flowered species, *M. sativa*, with most of the *M. falcata* characteristics such as color of flowers, shape of pods, and general habit of growth predominating.

The various lots of seeds were sown in short rows at several of the northern experiment stations, and while some lots were mixed more or less with seed of the yellow-flowered sweet clover, the alfalfa plants from each lot proved to be of the same general type. Because of its unusually vigorous growth, apparent resistance to drought and cold, abundant seeding habits, and wide range of flower colors, this alfalfa attracted attention from the first. In the original sowings the predominant flower color was yellow, but as a result of natural crossing that has taken place with purple-flowered strains since its introduction into the United States, the proportion of purple flowers has gradually increased until shades of purple and similar colors are now predominant.

The promising appearance of this alfalfa led to efforts to increase the seed until enough was available for sowing plots which were first established in 1919. Since that time Ladak alfalfa has been tested in comparison with other varieties at several experiment stations in the northern Great Plains (fig. 3) and to a limited extent farther east. In 1926 arrangements were made for growing 2,000 pounds of seed under contract. This seed was distributed to farmers mostly through the State experiment stations in the late winter and early spring of 1927, from which several favorable reports have already been received.

Ladak alfalfa has consistently shown somewhat less winterkilling than the hardy commercial alfalfas such as Grimm and the Northern Common, and in the majority of cases has yielded a somewhat greater tonnage of hay and generally has produced better seed crops. It makes a remarkably heavy first crop, outyielding other varieties

by a considerable margin which at times has amounted to as much as a ton per acre under favorable conditions. It is therefore especially valuable in those regions where, because of a limited moisture supply or a short growing season, only one cutting is normally possible. The variety ordinarily becomes dormant in the fall somewhat earlier than Grimm alfalfa and recovers more slowly after cutting. However, after the new shoots start they develop very rapidly and are usually ready for cutting as soon as the hardy commercial varieties. While outyielding such varieties as Grimm and Dakota Common in first cutting, it is more than likely to fall below them in tonnage of later crops. Regardless of this fact, however, Ladak alfalfa has usually equaled or exceeded in total yield for the season the varieties grown in comparison with it in the Northern States. It is the opinion of some that the hay is of better quality, having finer stems and being more leafy. Somewhat to the surprise of the experimenters in tests

FIG. 3—Ladak alfalfa in rows at Havre, Mont.

conducted at Manhattan, Kans., Ladak alfalfa stands among the three or four highest yielding varieties. It has not been as seriously affected by the bacterial wilt as the commercial alfalfas.

While the tests thus far conducted with the Ladak alfalfa have not shown any extraordinary superiority over Grimm alfalfa, still the advantage is believed to be sufficient to justify calling attention to the possibilities of obtaining larger yields from this variety, particularly in those regions where only one crop is ordinarily obtained. Even though the advantage in any individual case may not be great, it is believed that in the aggregate the advantages to be derived from more general use of the variety under those conditions to which it is adapted would be considerable. The supply of seed commercially available is at present very limited, but it is probable that there will soon be a considerable increase from the sowings made in the spring of 1927.

H. L. WESTOVER.

ANIMAL Disease Prevention Through Biologic Products The stockman of the present day faces many problems relating to the prevention, control, and eradication of animal diseases which formerly were unknown to him. Many factors are responsible for this situation. Close housing of livestock is more common, frequently without due regard to proper ventilation and sanitation. Transportation of animals, by both train and motor truck, is conducted on a scale not approached in earlier years. Ready means of transportation permits of the shipment of all kinds of livestock long distances with resulting opportunities for carrying infection into new areas. Exposure to disease brought into stockyards by infected animals is another possibility, present chiefly at the small markets where veterinary inspection is not maintained. When exposed or infected animals are sent to farming centers such animals become the means of spreading disease in the community. More ready transportation among the countries of the world has had its influence in distributing diseases heretofore confined to restricted areas.

Some Diseases Preventable by Immunization

The necessity of controlling animal diseases has been a powerful impetus in the development of biologic products as one means to the desired end. Although diseases now give the stockman more concern, science has contributed a wealth of knowledge helpful to their control through sanitation, immunization, and other methods formerly not available. Blackleg, which for years was a source of enormous losses to cattle growers, no longer need cause such losses, since immunization may be effected with reasonable certainty when treatment is applied at the proper time. But it took many years of research and experimental work to develop a dependable means of controlling this disease. Hog cholera long caused great losses and prevented hog raising under some conditions. Whole herds frequently were destroyed by the disease in a few days and their owners made bankrupt.

Anti-hog-cholera serum (fig. 4), well known now to practically all swine growers, was developed by the Bureau of Animal Industry, and affords the stockman a ready means of controlling this disease. If it is applied judiciously in connection with proper sanitary measures, the disease eventually may become an inconsiderable factor in swine growing. Hemorrhagic septicemia, which has long been of grave concern to stockmen, particularly cattle and sheep feeders, need no longer cause large losses. Products are available for use which if properly applied at the right time will immunize the animals against it. However, since the period of incubation in this disease covers a span of only a few hours and because several days are required to produce immunity, it is necessary that treatment be applied some time before the animals are exposed to the disease while en route from their home premises.

Use as Diagnostic Agents

Gradually means of controlling the different diseases by quarantine, sanitation, and immunization are being developed. Further-

more, biologic agents, such as tuberculin and mallein, are available for diagnosing the presence of such diseases as tuberculosis and glanders, which are insidious in their first stages and not discernible by clinical symptoms. The usefulness and importance of biologic products in preventing or controlling diseases can not be questioned, yet they may be dangerous unless prepared, distributed, and used under proper conditions. It is of great importance that the products be of sufficient potency to accomplish the purpose for which they are intended, but it is vastly more important that they shall be pure and free from any contamination which may transmit disease. (Fig. 5.) It is this danger which causes the department, under authority from Congress, to prohibit the importation of any biologic product, be it

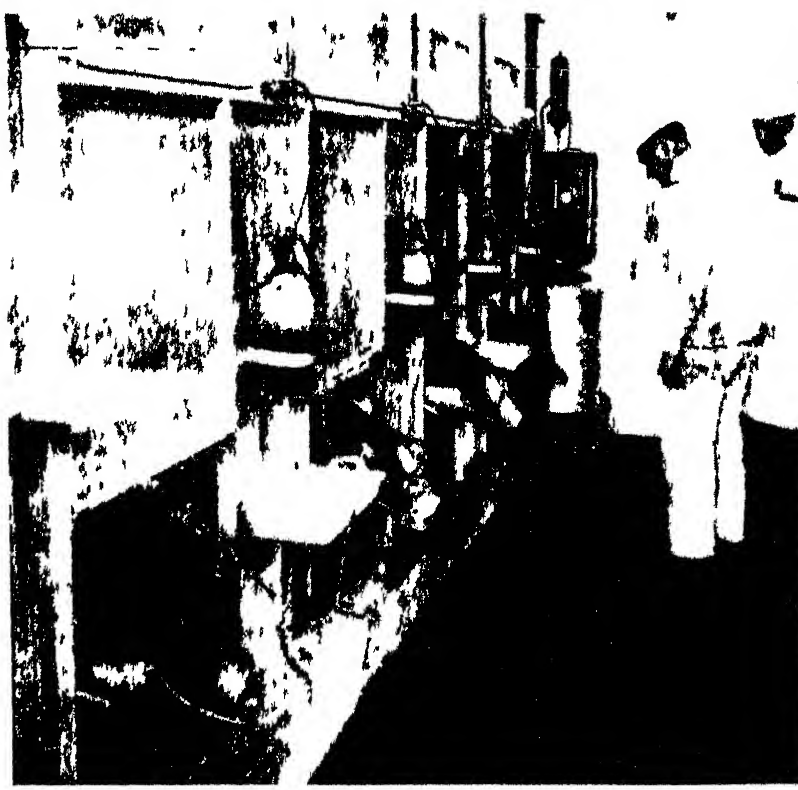


FIG. 4 – Injecting "immunes" with virus blood to make serum-producing hogs. The entire process of serum production requires several weeks

virus, serum, toxin, or some analogous product which in whole or in part is derived from animals susceptible to diseases which are prevalent in foreign countries but do not exist in the United States. For example, serums prepared from cattle are not admitted into this country for the reason that foot-and-mouth disease, rinderpest, and other maladies to which cattle are susceptible may be carried in the product and transmitted to animals in the United States.

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System of Licensing

All firms in the United States which prepare the products in question for shipment outside of the States in which produced are required to hold a license from the Secretary of Agriculture. Furthermore, before such license is issued inspectors of the Bureau of Animal Industry are required to see that not only the plant but its equipment, methods, personnel, and other conditions are satisfactory for conducting the work to be performed under the license. Then, after the issuance of the license, inspectors of the bureau require that all work be conducted with due regard for the best knowledge available and as specified in regulations promulgated by the bureau under the virus-serum-toxin act of 1913. In the case of establishments producing anti-hog-cholera serum and hog-cholera virus, inspectors are

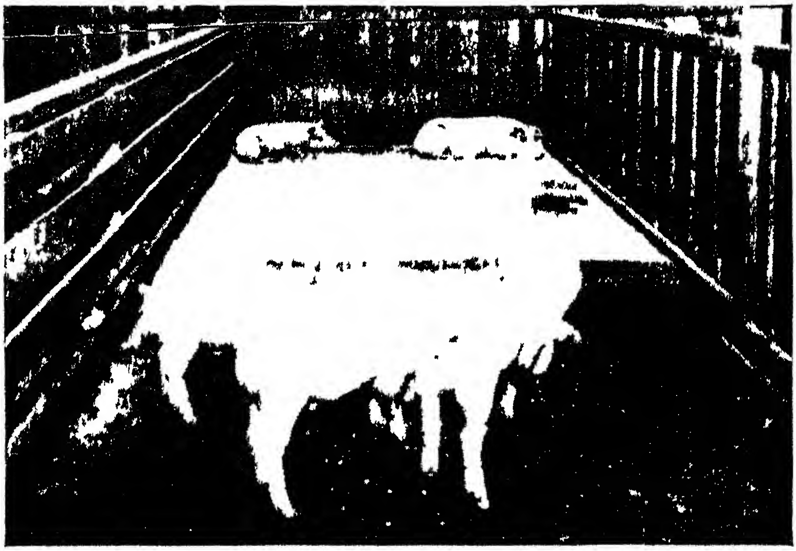

FIG 5.—A serum potency and purity test The two sick pigs in the rear received virus only, while the well ones in front received both virus and serum The result shows that the serum protected against cholera

present always whenever operations are conducted. The duty of these inspectors is to see that each animal used in the production of the products is suitable for the purpose and that each operation is carried out properly.

D. I. SKIDMORE.

ANIMAL Husbandry Cooperation Yields Results in Research

When broad problems confront our livestock industry, their constructive solution is a challenge to all. The fact that one State or group of States may have more grass, more corn, more soy beans, more cattle, or more hogs than other States does not relieve the latter from the responsibility of cooperating in research work. In these days of diversification in the industry it frequently requires a western range, a Corn-Belt feed lot, and an oven or broiling iron in a kitchenette of some eastern city

before a roast or steak is ready for the final test of its quality. If the meat is not so toothsome as the butcher led us to expect, we may have to examine livestock-production practices in several States, as well as the cooking of the meat, before ascertaining the cause.

The widespread and diversified character of the livestock industry and the time required to produce animals ready for market make it inevitable that many of its problems of husbandry be studied in a large way, if progress is to be made.

Eleven States Cooperating in Soft-Pork Studies

For more than a quarter of a century a number of States wrestled with the soft-pork problem. Boundary lines were all that separated some of them; yet each carried on the work independently, often without even consultation or comparison of results. To-day 11 States are working with one another and with the department on this problem. Approximately 3,500 representative hogs have been shipped from these States for slaughter and physical and chemical testing at the United States Animal Husbandry Experiment Farm, Beltsville, Md. It is believed that more progress has been made during each year of the cooperative effort than was made during the entire period of uncoordinated research.

Only by cooperating with several stations in the various sheep-producing regions of the country is the department able to accomplish a comprehensive study of the various factors which affect the growth of wool, such as climate, breeding, feeding, and variations in management practices. In addition to work in field and laboratory at Government stations in Maryland, Vermont, Idaho, and Montana, work is also being done at 12 State experiment stations representing the principal sheep-producing areas. Approximately 5,700 sheep are used in these wool studies.

Coordination of Effort Shortens Time For Solving Problems

If but one of the regions represented could be studied at one time, the progress of the investigations would suffer enormously, and it would require many times the number of years to obtain an equal amount of useful and comprehensive data than there are stations engaged in the study. A given result may be of but minor significance when obtained at any one station, but when data obtained under widely varying conditions (other factors being uniform) are correlated, the result may be of prime importance. When properly managed, a series of investigations by cooperating agencies which use uniform methods may be fully as accurate as if the research were done by one agency. For example, wool-growth measurements on the same type of sheep are taken on exactly the same day by stations which are two or three thousand miles apart.

At the time of the passage of the Purnell bill a similar plan had been begun for a nation-wide study of the factors which influence the quality and palatability of meat. To-day 23 States are cooperating in this work with the department, the National Livestock and Meat Board, the American Institute of Meat Packers, and other agencies. During the last year approximately 1,800 cattle and lambs were graded by a special committee representing the department and State experiment stations, when the animals were started on the experiment,

FIG. 6.—To measure the quality of beef on the hoof, in the cooler, and as cooked meat on the platter requires the cooperation of many workers

when they were fattened for market, and again when slaughtered. (Fig. 6.) Of this number, 954 animals were sent to the animal husbandry laboratory for detailed analysis and study.

More than 340 representative cuts were sent in special containers to the laboratory for the same purpose. Studies were made of slaughter data, cooling methods, ripening processes, mechanical tests for tenderness, chemical analysis, histological research, and cooking methods. Finally, a special committee judged the palatability of the different meats and meat products. These investigations, it may be repeated, have been cooperative in every respect. Through pooling of knowledge, financial resources, experimental facilities and effort in a carefully devised research satisfactory progress has been made.

Because of the value of teamwork and of mutual exchange of ideas, improved methods, and year-by-year results, it is probably conservative to say that these several agencies can make much more than 25 times the progress each year than any one of them could show if working alone, and at much less cost to the taxpayer

E. W. SHEETS.

ANIMAL Quarantine Stations are Barriers Against Disease The development of the livestock industry of the United States to its present high standard has from the very beginning depended primarily on purebred types and breeds of animals of foreign origin. Such well-known breeds of beef cattle as Shorthorn, Hereford, and Aberdeen-Angus had their origin in Great Britain. The Jersey and Guernsey originated in the Channel Islands bearing those names. Dutch Belted cattle had their beginning in the Netherlands, and the Brown Swiss in Switzerland. The Rambouillet or French Merino sheep is native to France. This list could be continued to cover the names of many other recognized breeds of livestock of foreign origin.

It is desirable that the importation of purebred animals of the best types be permitted, but with such safeguards as will provide adequate protection to the livestock industry of the United States from dangerous contagious livestock diseases. Among the more important of these are foot-and-mouth disease, rinderpest, contagious pleuropneumonia, and surra.

Live-Animal Import Regulations in Brief

The Department of Agriculture has provided regulations and methods of control which require that before cattle, sheep, other ruminants, and swine may be imported into the United States from any part of the world—except Canada and from Mexico by land—the importer must make application to the Secretary of Agriculture for a permit. If the proposed importation is from a country whence the Secretary considers it safe to allow the importation, a permit is issued by him in two sections. One part is presented to the American consul at the foreign port of shipment and the other section to the collector of customs of the port of entry specified in the permit.

Before cattle, sheep, other ruminants, and swine may be landed on United States soil from any part of the world, except Canada, Mexico, Central America, and the West Indies, they must be accom-

panied by a certificate from the chief veterinary officer of the country of origin clearly showing that they were kept in the country for not less than 60 days prior to shipment and that during that time the country was entirely free from foot-and-mouth disease, rinderpest, and surra. For cattle the certificate must also show that the country had been free from contagious pleuropneumonia. In the case of sheep, goats, and domestic swine this requirement is modified and requires that only the district of origin must have been free from that disease. The certificate for wild ruminants and wild swine for exhibition purposes need show only the freedom of the district from foot-and-mouth disease, rinderpest, contagious pleuropneumonia, and surra. All cattle for breeding or dairy purposes offered for importation into the United States must be accompanied by a tuberculin-test certificate issued by an official veterinarian of the country of origin showing their freedom from tuberculosis.

Animal Quarantine Stations and Their Locations

Following the organization of the Bureau of Animal Industry, in 1884, it was found necessary to provide animal quarantine stations

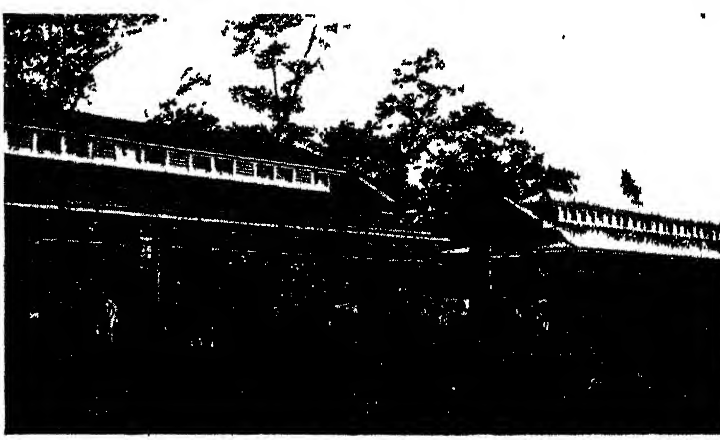

FIG. 7.—View of typical buildings at the Federal quarantine station, Athenia, N. J. All the equipment used can be cleansed and disinfected readily

where imported cattle could be held under observation until it was found safe to release them without fear of conveying disease to American livestock. These stations, three in number, were located on leased land at Garfield, N. J., for the port of New York; Littleton, Mass., for the port of Boston; and Halethorp, Md., for the port of Baltimore. Being on leased land, the buildings were of a temporary character. Because of the danger of importing disease in other classes of animals besides cattle, the quarantine laws and regulations were extended in 1890 to include the quarantine of sheep, other ruminants, and swine. This made it desirable to provide permanent stations on Government-owned land. The first of these permanent stations to be established was at Athenia, N. J., (fig. 7) for the port of New York, in 1900. In 1911 stations were established at Turners Station, Md., for the port of Baltimore, and at Littleton, Mass., for the port of Boston. The combined capacity of these stations

is approximately 1,000 cattle besides additional space for sheep, other ruminants, and swine.

All cattle, sheep, other ruminants, and swine imported into the United States from any part of the world except Canada, Mexico, Central America, and the West Indies are subject to detention at one of the animal quarantine stations for periods varying from at least 30 days for cattle to at least 15 days for sheep, other ruminants, and swine.

Under the classification of "Other ruminants" are included camels and numerous varieties of animals for zoological parks. (Fig. 8.) Under the term "swine" are included the common domestic hog and several of his near relatives that are frequently seen in zoological gardens.

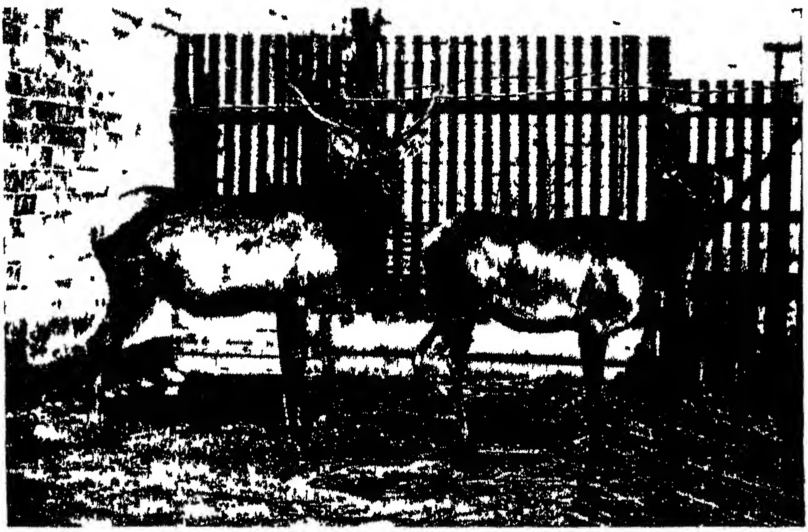

FIG. 8.—Imported red deer Many species of wild animals are received and held for observation and necessary tests

Dogs Treated for Tapeworms

Breeds of dogs, such as the Collie or Shepherd, that are commonly used in the handling of sheep or other livestock, are subject to detention at animal quarantine stations. Here they are inspected for a species of tapeworm, the cystic form of which causes the gid disease of sheep. Dogs that are found to harbor this particular parasite are given veterinary treatment that will free them entirely from the infestation, making it safe for them to be in contact with sheep or other livestock.

When livestock arrive at the American port of entry specified in the permit none are permitted to land until all the animals have been given a very careful inspection by a veterinary inspector of the Bureau of Animal Industry. If they are found to be apparently free from evidence of contagious disease, they are permitted to be transferred direct from the vessel to railroad cars on car floats which have been placed alongside the steamship. (Fig. 9.) Within

a few hours after being unloaded from the vessel the animals arrive at the quarantine station. Here they are promptly unloaded and the cars cleaned, washed, and disinfected. Each importer's lot of stock is assigned to a stable or stables, where it must be kept continuously throughout the quarantine period. Rigid rules are enforced at the quarantine stations, which keep the animals in one lot from any possible contact with the animals in another lot. Attendants caring for a particular lot of livestock are not allowed to visit the stables and pens containing any other lots of livestock. Owners of animals under quarantine are permitted to visit their stock only when considered necessary. After such visits they are subjected to disinfection before being permitted to leave the quarantine station.

During the period of quarantine all animals are subjected to frequent veterinary examination either by the superintendent of the station or by an inspector under his supervision, and, whenever con-

FIG. 9.—Unloading import livestock from an ocean vessel. These animals are transferred to cars for direct shipment to a Federal quarantine station. The bedding is destroyed

sidered necessary, blood tests or other similar tests may be made to determine their freedom from disease. During the last 10 days of the quarantine period all cattle are tuberculin tested (fig. 10) by one or more of the methods that have been approved and all reactors are destroyed without compensation to owners.

Examples of the Service Rendered

The necessity for the maintenance of animal quarantine stations and the efficiency of the methods used to prevent the introduction of foreign, contagious livestock diseases have been demonstrated on many occasions, but two are especially worthy of mention.

In 1905, 65 goats of milking strains were imported from the island of Malta. They arrived at the port of New York and after inspection were transferred to the animal quarantine station at Athenia for quarantine. During the quarantine period some of the animals were found to be suffering from a peculiar form of disease. Samples

of blood and tissues were sent to the pathological laboratory of the Bureau of Animal Industry at Washington, D. C., and the specific organism of Malta fever was found. To prevent the possible spread of the disease to the goat stock of the country, all the animals in the importation were destroyed.

In 1906 an importation of 51 head of Zebu cattle was permitted importation from Bombay, India. These animals arrived at the port of New York, and as a special precaution they were quarantined on a small island in New York Harbor in fly-proof quarters. By means of blood examinations and rabbit inoculations it was found that 18 of the 51 cattle were infected with surra. The diseased animals were slaughtered and their carcasses with all their parts, including their hides, were either incinerated or buried after being covered

FIG. 10 —Applying the tuberculin test to imported cattle at a Federal quarantine station

with quicklime and sulphuric acid. The remaining animals were held under an extended quarantine until tests demonstrated that they could be safely released.

Foot-and-mouth disease, rinderpest, contagious pleuropneumonia, surra, and many other serious contagious diseases of livestock are prevalent in many parts of the world. Accordingly, constant and vigilant efforts must be maintained at American ports of entry by careful inspection of all imported livestock. Only when such animals pass the rigid inspection is it safe for them to become a part of the great livestock industry of the Nation.

Though there have been several outbreaks of foot-and-mouth disease in the United States, it is a noteworthy fact that in no instance has the disease been traced to foreign livestock that passed the barriers established by the animal quarantine stations.

A. E. RISHEL.

APPLES and Pears Are Often Injured When Boxed in Douglas Fir In the handling of the commercial apple crop of the Pacific Northwest, attention is continually directed to the elimination of all defective fruit. This is not entirely to preserve the appearance of the market package, invaluable as that is recognized to be, but also because it is a well-known fact that injuries to the skin of the apple open the way for rot organisms. Hence injuries of all kinds are regarded with suspicion, and unremitting efforts are made to discover their cause and prevent their occurrence.

One of the most unusual and unexpected sources of injury was discovered when it was found that Douglas-fir boxes "scald" apples and pears coming in contact with the wood. This injury has been called "box scald" to distinguish it from "soft scald," which it some-

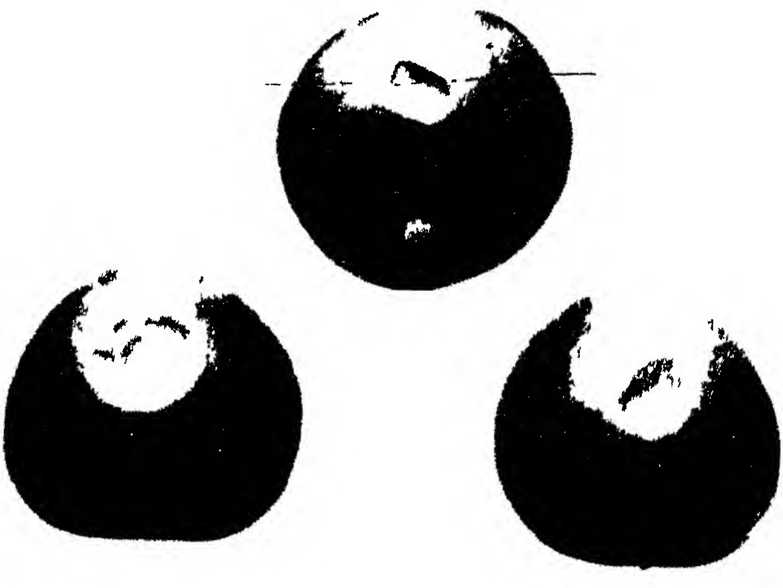

FIG. 11.—Injury to apples by Douglas-fir boxes as found in commercial pack

what resembles, and from ordinary apple scald, sometimes called "barrel scald" or "storage scald."

In its early stages box scald consists merely of a brownish discoloration of the skin at the place where the fruit is in contact with the fir wood, but with age the injury deepens and enlarges, becoming darker in color with edges sharply demarked. (Fig. 11.) This injury has been observed from time to time in the past, but was confused with box bruises or, in severe cases, with soft scald. However, its occurrence in unusual amounts in certain cases last year led to an investigation which disclosed its relation to the Douglas-fir boxes.

During the fall of 1926 many boxes of picked apples were left in the orchards, unprotected from rains. In a number of instances the apples in the bottom of these boxes showed characteristic scalding where they were in contact with the wood. Later, in February,

after the crop was packed and stored, several carloads were found in which the injury was unusually prevalent. In all of these cases it was found that the affected apples were in contact with Douglas-fir veneer and that injury was most common and severe where very resinous boards were used.

Injurious Factor in Boards

An investigation was subsequently conducted, and it was determined that the injurious factor is not produced in the steaming process to which the logs are subjected prior to cutting the veneer, but that it is present in sawed boards of this species as well. It was further disclosed that while injury is readily produced by resinous heartwood, the sapwood can be used with safety. However, it is not economically practicable to segregate the two portions of the log. Experimental work also demonstrated that other species commonly used for fruit boxes in the Pacific Northwest, such as western yellow pine, hemlock, and spruce, can be used without similarly affecting apples or pears.

Apples placed on wet Douglas-fir heartwood were injured within 24 hours, and similar injury was caused by dry fir boards within three days. The presence of two layers of paper between the fruit and the box was no protection under commercial conditions. Pears held under the same conditions are not so quickly injured.

The specific chemical substance which causes the injury appears to be water soluble and associated with the resin in the heartwood of Douglas fir, but it has not been isolated and identified. While definite knowledge on this point would be of considerable scientific interest, it probably would add nothing of direct practical value. The only practical procedure in the avoidance of this injury to apples and pears is to eliminate the Douglas fir and to use for boxes only such woods as are known to be noninjurious.

D. F. Fisher.

APPLE Tree Areas of Heavy Concentration Widely Scattered The recent agricultural census makes possible a graphic view of the distribution of apple trees in the United States, both for trees of bearing age and for those not of bearing age. Most areas of heavy concentration of trees (fig. 12) are in regions adjacent to the larger consuming centers. Outside of those areas there is a fairly even distribution of trees in those States north of the Cotton Belt and east of the Great Plains. In the Western States natural adaptation to apple production helps to overcome distance from consuming markets and concentration of trees is marked in a number of areas, but outside of these there is no general distribution of trees which is typical of the farming regions in the Eastern States.

Those areas having the largest numbers of trees of bearing age are the so-called commercial areas. The Cumberland-Shenandoah-Potomac and the western New York areas are probably the most important of those east of the Missouri River; the largest producing area of the West is in Washington and consists of a number of valleys, of which the principal ones are the Wenatchee, the Yakima, the Spokane, the Walla Walla, and the Okanogan. The important mid-

western areas are in Michigan along the eastern shore of Lake Michigan; in the Ozark region of southwestern Missouri and northwestern Arkansas; and in Calhoun County, Ill., and in the southern portion of that State. Other important sections are the Hudson River Valley of New York, the early-apple belt which includes New Jersey, Delaware, and the Eastern Shore of Maryland; the Piedmont section of Virginia and North Carolina; the Sebastopol and Watsonville sections of California; the Payette Valley in Idaho; the Salt Lake Basin in Utah, the Bitter Root Valley in Montana, and the western slope in Colorado. This is not a complete enumeration of all of the commercial areas, but includes the major ones.

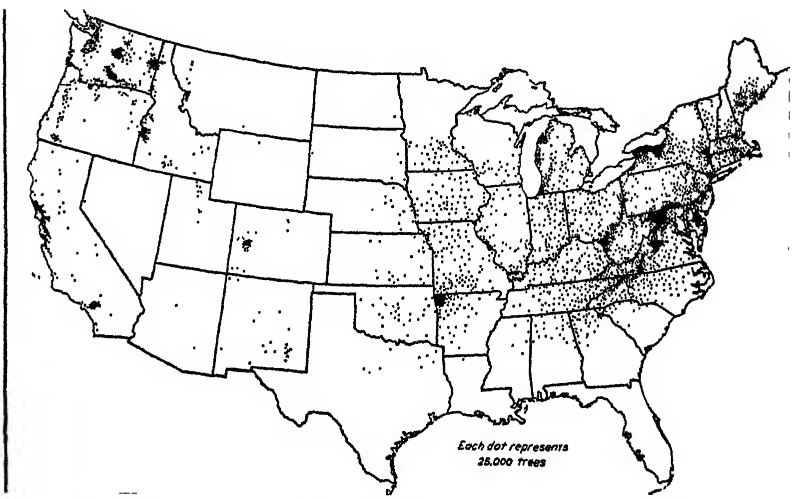

FIG. 12.—The outstanding areas of planting are in western New York, the Cumberland-Shenandoah Valleys, the Ozark region, Washington, and California. In the States east of the Missouri River and outside of commercial regions the trees are fairly evenly distributed

Distribution of Younger Trees

In comparison with the older trees there is a very noticeable difference in the distribution of the younger trees. (Fig. 13.) In the Western States, especially where the orchards are comparatively young and in many cases had not reached full bearing capacity, fewer nonbearing trees were reported as compared with the Eastern States. In the eastern commercial sections where the orchards are supposed to average much older there is an apparent concentration of young trees. The Cumberland-Shenandoah region, western New York, southwestern Michigan, Illinois, and the Ozark region all have comparatively heavy plantings of young trees. Washington in the Yakima and Wenatchee Valleys, and California around Sebastopol have the largest numbers in the western States. Even outside of the commercial areas there were more young trees scattered throughout the Eastern States.

Expressing the numbers of young trees as a percentage of the bearing trees the ratio is still more evident. Of the Western States, California had 25 per cent as many young trees as trees of bearing age, Washington had 15.5 per cent, and Oregon 9.3 per cent. The percentage for all the Western States is 14.6 per cent as compared

with 37.0 per cent for the barrel-apple States. For the more important Eastern States the percentage that young trees were of bearing trees was: New York, 25.6 per cent; Michigan, 33.8 per cent; Illinois, 63.8 per cent; Virginia, 28.4 per cent; Maryland, 28.8 per cent; Pennsylvania, 30.9 per cent, and West Virginia, 24.8 per cent. New Jersey in the early-apple belt, had 58.2 per cent as many young trees as bearing trees, and North Carolina, which is primarily an early-apple State, although its apple area is in the Piedmont section, had 31.5 per cent.

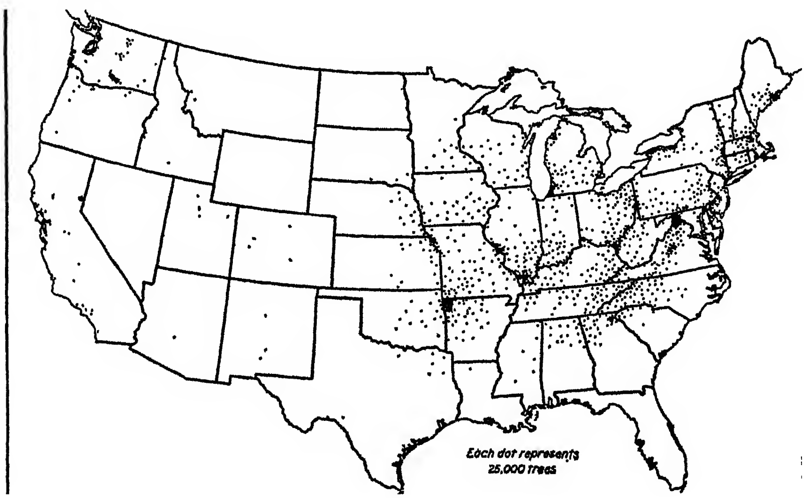

FIG. 13.—The principal plantings of young trees are in the Cumberland-Shenandoah Valleys, northwestern Arkansas, western New York, around Benton Harbor, Mich., and in the two Illinois areas

It is readily apparent that the plantings during the few years prior to 1925 were to a large extent in the eastern apple areas and were chiefly in the commercial areas.

W. H. YOUNGMAN.

APPLE Trees Fewer Since 1910 but No Drop in Apple Crop The number of apple trees in the United States has been declining since 1910, according to census figures. For each 100 trees in the country, in 1910, there were 70 and 64, respectively, in 1920 and 1925. This decrease in number of trees from 1910 to 1925 was around 79,000,000 out of a total of 217,000,000 trees reported in 1910.

This apparent large reduction in the total number of trees is less alarming than appears at first glance. Except in years of adverse weather conditions, there has been no shortage of apples, and the crop of 1926 was the largest produced in many years. In fact, commercial production of apples has been increasing, and it is believed that a large part of the reduction in the number of trees has taken place in scattered family orchards and in the less favorable commercial areas. In some areas commercial production has increased because of the increased bearing capacity of trees through an increase in age, through better selection of varieties and better orchard management.

In the box-apple region (Mountain and Pacific States), 55 per cent of the trees were not of bearing age in 1910, compared with 13 per cent in both 1920 and 1925. The apple industry in this region is relatively new and for the good of the industry it is well that plantings have not been large enough to maintain the proportion of trees not of bearing age that existed in 1910. As the 15,000,000 trees not of bearing age in 1910 came into bearing the producing capacity of the trees in the box region increased enormously from 1910 to 1920. For each 100 trees of bearing age in 1910 there were 175 trees of bearing age in 1920. From 1920 to 1925 the number decreased and stood at 151 for each 100 trees of bearing age in 1910.

Conditions in Barrel-Apple Area

In the barrel-apple region the proportion of trees not of bearing age has remained practically constant at about 27 per cent of the total number for 1910, 1920, and 1925. The decrease per 100 trees not of bearing age in the barrel region has been from 100 trees in 1910 to 65 in 1920 and 62 in 1925.

The highest rate of decrease in numbers of trees from 1910 to 1920 occurred in the East North Central, West North Central, Mountain, West South Central and East South Central States. Since 1920 the decrease in these regions has continued but at a much slower rate. In the New England and Middle Atlantic States the decrease has been gradual and at a relatively lower rate.

The Pacific coast region is the only one in which the number of trees in 1925 was practically the same as the number in 1910. Here the total number of trees has been nearly maintained mostly from the large number of trees which were not of bearing age in 1910. The trend in 1925 was downward from the peak of 1920.

Trend in South Atlantic States

The trend in the number of trees in the South Atlantic States more nearly resembles the trend in the New England and Middle Atlantic States than in any other group of States, although somewhat less precipitous from 1920 to 1925 than in the former States.

For the country as a whole information now available indicates that there may be a continuation of the trend downward but at a less proportional rate of decline. Information is not at hand to indicate the probable time when the trend will turn upward. A survey of the apple industry is now under way in the commercial apple-producing States which will give more definite information concerning the probable future trends.

M. R. Cooper.

BANKRUPTCY Rate in Agriculture Much Higher than Pre-war

Business failures are accepted evidences of the industrial and commercial conditions of the nation. In the past, business failures have been relatively few in years of general prosperity and relatively numerous in years of depression. Similarly, one of the indications of the

financial condition of agriculture is the number of bankruptcies among farmers.

The number of farmers who normally resort to bankruptcy courts is small. Even in times of financial stress more farmers lose their farms or property without foreclosure or bankruptcy, and a much larger number are able to retain their property through the leniency of creditors. The great increase in the number of farmers who resorted to bankruptcy proceedings in recent years is significant as one indication of the accumulated effect of the financial condition of agriculture since 1920.

Before the war, during the 10-year period 1904–1913, the average number of farm bankruptcies for each 1,000 farms in the United States was only 0.14. During the three years ended June, 1926, there were an average of 1.22 per 1,000 farms. In the year ending June, 1927, the number declined to 0.99 per 1,000 farms. Compared with what prevails in business, where normally there are about 10 failures per 1,000 firms, farm bankruptcies are few, but their recent

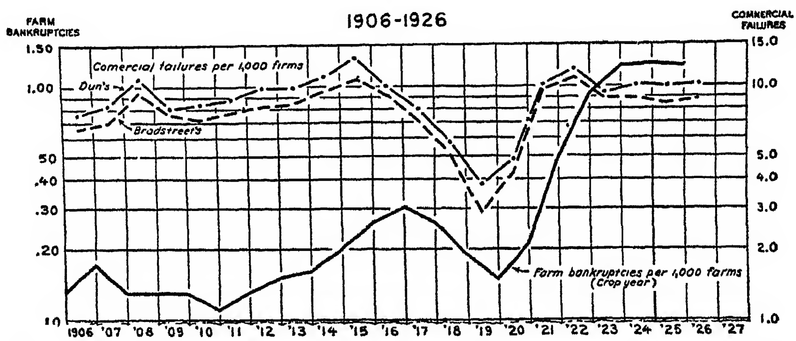

FIG. 14.—Ordinarily there is a higher rate of failures registered through bankruptcy courts in commercial business than in farming. While farm bankruptcies per thousand farms are still less than commercial failures per thousand firms, there has been a marked increase since 1920 reaching a high point in 1924. In studying the above chart, do not overlook the fact that the farm-bankruptcies scale is 10 times the commercial-failures scale

increase has been very great, nearly tenfold, whereas in commercial failures there has been no such increase. (Fig. 14.)

Farm bankruptcies began increasing early in the war period. In 1917 the number had increased to 0.3 per 1,000 farms, or more than double the number before the war. By 1919–20 they declined nearly to the pre-war average but increased markedly to an average of 1.22 per 1,000 farms in the three years ended in 1926.

When compared with other indications of farm conditions, such as prices of farm products, it appears that there is a time lag between changes in agricultural conditions and their reflection in the rate of farm bankruptcies. Thus the low failures of 1919–20, a year when farm prices had already tumbled considerably, undoubtedly reflected the profitable years of 1917–18 and 1918–19, and the increase in bankruptcies in 1922–23 and 1923–24 reflected the unusually difficult farm situation of 1920–21 and 1921–22, when farm prices were at the lowest. The reduced number of failures in 1926–27 is a reflection of the improved agricultural earnings in recent years compared with those of the worst years of the postwar depression.

Delayed Results of Depression

Similarly, the high rate of farm bankruptcies during the past three or four years does not signify that agriculture as a whole has not made considerable recovery from the unusually depressed condition of 1921–22, but that some of the effects of those years are only now becoming evident and that the improved earnings of the past three or four years have not been adequate to stave off permanently bankruptcy proceedings which had been held in abeyance by creditors.

One explanation of this time lag is that farmers tend to burden themselves in prosperous times by additional property bought outright or mortgaged. Low prices which are not adequate to cover the capital charges and interest payments, previously incurred, are generally expected to be only temporary. Consequently, both creditor and debtor are inclined to wait for better times. Another factor is that some time is required to conclude bankruptcy proceedings.

A decrease in the recent high rates of farm bankruptcies may be expected to take place if farm income continues to improve during the next few years, but the higher ratio of farm debts to property values may tend to maintain for some time a farm bankruptcy rate higher than in the pre-war years. A large part of the farm debt incurred during the high-price years before the depression has not yet been liquidated and continues to be a heavier burden on income than formerly.

Increase is General

Studied geographically (fig. 15), the recent changes in farm bankruptcies reveal the following facts:

(1) The rise in farm bankruptcies has been general in all sections of the United States.

(2) Northwestern States, including the Dakotas, have shown the most marked increases. No region or group of States has escaped an increase in farm bankruptcies, but the increase has not been great in the States east of the Mississippi, excepting Georgia, nor in the Cotton Belt west of the Mississippi.

(3) If a small number of bankruptcies per thousand farms may be taken as indicative of agricultural stability, the region that shows the greatest degree of stability lies east of the Mississippi, north of the Cotton Belt. Maine, with its dependence largely on cash income from the highly variable potato crop, is an exception..

(4) The areas where the larger number of farm bankruptcies have occurred in recent years are also the areas where most of the recent bank failures have taken place. During the 20-year period from 1900 to 1919, inclusive, of a total of 927 State and national banks failing, 322, or 35 per cent, were in the agricultural States of Montana, North Dakota, South Dakota, Minnesota, Nebraska, Iowa, Missouri, Oklahoma, Texas, and Georgia. In six years (1920 to August, 1925, inclusive) of a total of 2,494 State and national-bank failures, 1,671, or 67 per cent were in these 10 agricultural States.[1]

(5) A review of the trend in land values indicates that the areas of relatively numerous farm bankruptcies are not necessarily the areas

[1] See report of the United States Senate Committee on Banking and Currency, Hearings, 1926, pp. 91 and 92.

where land values rose abnormally during 1919 and 1920. In Georgia, for instance, land values in 1920 reached 218 per cent of their pre-war average, compared with 169 per cent for the country as a whole, but farm bankruptcies have not been more numerous

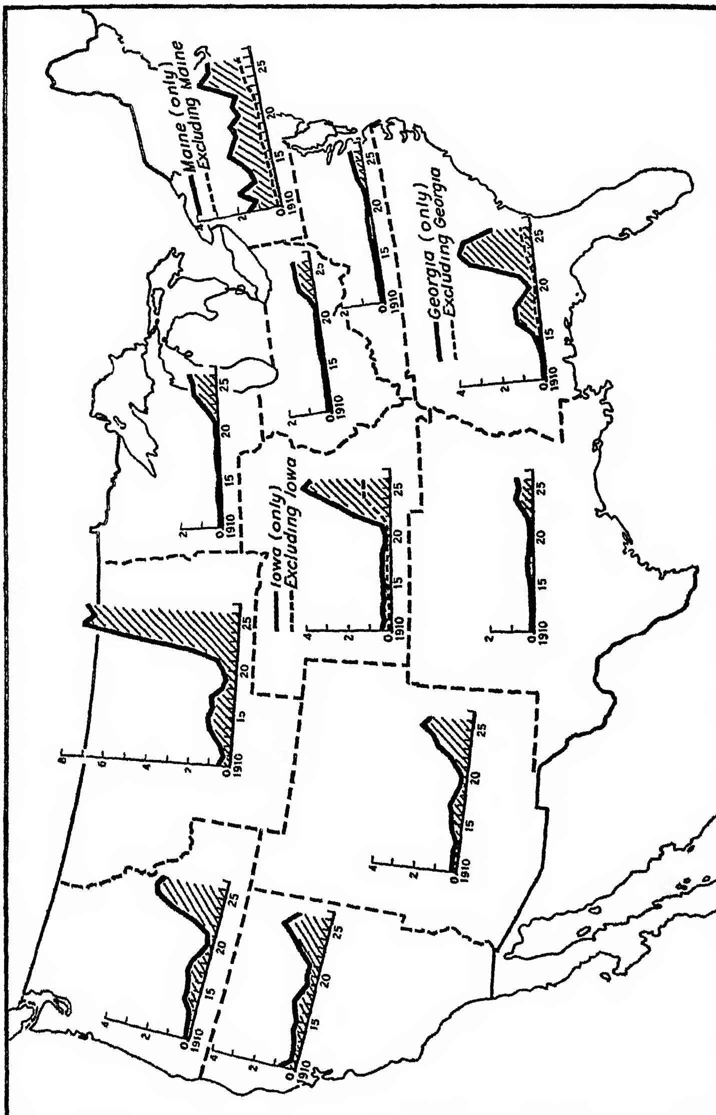

FIG 15.—The ratio of farm bankruptcies to number of farms rose in all States after 1920, reaching a peak in most States about 1924. The highest rate of failures came in the northern Great Plains area. East of the Great Plains the States most affected were Maine, Georgia, and Iowa

there than in the extreme Northwest (Oregon, Washington, and Idaho) where land values reached only 143 per cent. In 1926, however, land values in these States and in Georgia were only 112 per cent of their pre-war average, compared with 124 for the country as a whole.

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Condition in Iowa

The relatively large number of farm bankruptcies in Iowa may be considered in relation to the abnormal rise in land values which by 1920 reached 213 per cent of the pre-war average, but in four States, North Dakota, South Dakota, Montana, and Wyoming, where farm bankruptcies have been most numerous, land values reached only 158 per cent of the pre-war position. Since then land values in those States have fallen below the pre-war averages, while in Iowa they have also fallen but are still 130 per cent of their pre-war level.

These comparisons suggest that the financial difficulties among farmers, which have shown themselves in farm bankruptcies, are to be associated both with abnormally high land values before the depression and with abnormally low values since then. In the first case, the road to the bankruptcy courts has probably led through high capital values, abnormal capital charges (interest, taxes, rent), and depressed incomes inadequate to meet the obligations assumed on the previous high income levels. In the second case, farm bankruptcies have probably arisen more directly from the disparity between the uncertain, highly variable, and generally depressed farm receipts on the one hand, and the relatively high and inflexible costs on the other.

L. H. Bean.

BARBERRY Eradication Reducing Stem Rust Losses in Wide Area

Stem rust is the most destructive disease of small grains in the United States. Each year it has destroyed millions of bushels of grain. In 1916, when weather conditions were favorable to the epidemic spread of this disease, the loss of small grains in the United States was more than 200,000,000 bushels. For the 12-year period from 1915 to 1926, inclusive, the estimated losses of all small grains from stem rust in the 13 north-central barberry-eradication States of Colorado, Illinois, Indiana, Iowa, Michigan, Minnesota, Montana, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin, and Wyoming aggregated 564,586,000 bushels. For the same period the estimated loss of wheat alone in these 13 States was 398,038,000 bushels. In many districts farmers had abandoned wheat growing because of the recurring attacks of stem rust.

Relation of the Barberry to Stem Rust

The relation of the common barberry to the occurrence of black stem rust was suspected as early as the middle of the seventeenth century. European farmers 250 or more years ago were convinced that the barberry was responsible for their stem-rust losses, and they destroyed a majority of the common barberries near their grainfields. The earliest law condemning the barberry was passed in Rouen, France, in 1660. The Colonies of Connecticut, Massachusetts, and Rhode Island passed barberry-eradication laws before the Revolutionary War. It was not until 1865, however, that De Bary experimentally produced rust on the small grains by infecting them with the rust from the leaves of the common barberry. De Bary's results have been confirmed many times since. Countless other

experiments indicate that no plant except the common barberry harbors and spreads stem rust of grains. In the north-central grain-growing States, many farmers have noted the spread of stem rust from barberry bushes. Hundreds of local epidemics of rust spreading from barberry bushes have been observed and mapped within the last few years.

How Barberries Spread Stem Rust

A common barberry bush 6 to 8 feet in height may produce more than 64 billion stem-rust spores in a single year. These spores are extremely small and may be carried by the wind. Each of these spores that is carried by the wind to susceptible grains or grasses may then produce a rust pustule which contains about 200,000 red or summer rust spores. Each one of these summer spores that alights on a grain plant may produce 200,000 more red spores within a week or 10 days. Thus the spread of rust continues until the grain nears maturity, at which time black spores, which are able to live through the winter, are produced. Such a tremendous spread of rust from a single common barberry may ruin the small grain of an entire community. Rust damage from a single hedge of barberries has been traced definitely to a distance of over 100 miles.

In 1918 the United States Department of Agriculture, in cooperation with the 13 North Central States of Colorado, Illinois, Indiana, Iowa, Michigan, Minnesota, Montana, Nebraska, North Dakota, Ohio, South Dakota, Wisconsin, and Wyoming, organized and started a campaign to eradicate the common barberry from these States. The first year of the campaign was spent largely in publicity activities and in effecting the voluntary removal of large barberry hedges within these States. Within a short time after the campaign began, State laws or regulations were passed in each of these 13 States to compel the removal of the harmful barberry. However, the removal of barberries has been accomplished almost entirely by the voluntary cooperation of the property owners.

Rust Spread Reduced

During the first years of the campaign a preliminary survey was made in the cities, towns, and rural districts of these States, in an effort to find and eradicate the largest numbers of bushes, especially fruiting bushes, in the shortest possible time. This reduced the tremendous spread of rust from infected bushes and the spread of barberry seeds from the fruiting bushes. As a result of this preliminary survey, the very great majority of planted hedges and bushes was found and destroyed, but the tremendous task of finding and destroying the escaped bushes still remained.

Since 1924 the surveys for barberries have been of a more intensive nature. An attempt has been made to destroy every barberry bush and seedling from both city and rural properties of the areas covered. The yards, gardens, parks, cemeteries, hedges, groves, fence rows, stream banks, pasture lands (fig. 16), thickets, wood lots, and woods, and wherever barberries may grow, are being covered by this intensive survey. Only cultivated fields are excepted from survey. Over 1,888,000 farms and thousands of towns and cities, including some of the largest cities of the United States, must be covered in this survey.

Problems of Survey and Eradication

The common barberry is not a native of the United States but was introduced early in the period of their settlement. Further introduction of the bush into the 13 North Central States continued until the beginning of the barberry-eradication campaign, so that by 1918 the bush was well established in these States and millions of planted barberries were growing in this important small-grain area. The seeds of these planted bushes had been spread by birds, so that this area became infested with additional millions of escaped bushes. These bushes from bird-sown seeds are growing in native timber and in swampy areas, in groves, wooded pastures, and orchards, along fence rows, stream banks, and irrigation ditches, and in fact in every sort of situation to a distance of 6 to 10 miles from the original plantings. A midsized barberry bush will produce about 22,000 seeds a year, and hundreds of thousands of seedlings are now growing in the vicinity of the old hedges and bushes. Many of these bird-sown bushes are fruiting, and their seeds in turn have been spread to still

FIG. 16.—Escaped barberry bushes growing in a pasture, Pine Island, Minn. These bushes grew from seeds scattered by birds from a planted barberry hedge

greater distances from the original plantings. These areas of barberries escaped from the original plantings have coalesced so that many counties or large portions of counties are thoroughly infested with common barberries. In the entire 13 States no grainfields are very far distant from barberry bushes.

The progress of the intensive survey, started in 1924, necessarily has been much slower than the progress of the preliminary survey. A great deal of foot scouting is necessary in hunting through woodlands to determine the outer limits of areas of escaped bushes and to find and eradicate every bush. In many instances the intensive survey has involved the foot scouting of entire townships and often of large portions of entire counties. The inspection of dense groves and woods, thickets, briar patches, tangled growths of nettle, clematis, and poison ivy, steep bluffs and river banks, as well as nearly impenetrable swamps, makes complete eradication of these bushes a tremendous task. However, every square foot of such areas must be thoroughly inspected to insure the destruction of every bush in order to prevent the spread of rust and the further dissemination of barberry seeds.

Only a Few Areas Cleared

Up to this time only a few small areas in each State are entirely cleared of barberries. No county in the entire area is believed to be entirely cleared of these bushes. Seedlings often appear by the hundreds of thousands after the original bushes are removed. Seedlings have been coming up as long as eight years after fruiting bushes were killed. Since barberry seeds may germinate and produce a bush large enough to fruit in five years, additional surveys of these areas will be necessary to prevent a further spread of seeds from new bushes not yet in existence. In many small areas barberry bushes are so numerous that they are the most prevalent vegetation. In Geauga County, Ohio, over 35,000 barberry bushes and over 800,000 seedlings were found on one 60-acre tract in 1927. The destruction of these bushes and seedlings alone was a tremendous task, requiring more than 257.5 tons or 11.5 cars of salt.

To obtain the cooperation of the 32,000,000 people in these 13 States in finding and helping to destroy the common barberry, widespread publicity and education are necessary. Complete cooperation of the public depends upon its knowledge of the campaign, its ability to recognize the barberry, and its knowledge of the relation of the barberry to black stem rust. In carrying forward this publicity and educational work the United States Department of Agriculture, the 13 cooperating States, and the Conference for the Prevention of Grain Rust, an organization of business and agricultural leaders with headquarters in Minneapolis, have distributed approximately 5,000,000 pieces of publicity and educational matter. In addition, hundreds of thousands of newspaper articles have informed the public of the characters of the common barberry, its relation to stem rust, and the progress of the eradication campaign. Lesson plans, bulletins on barberry and stem rust, sample twigs of barberry, and samples of rusted grains have been sent to more than half of the 90,000 schools in the eradication area so that school children may learn to know the barberry and may aid in locating and destroying it.

Results of the Campaign

Up to June 30, 1927, a grand total of 14,411,662 barberry bushes and seedlings have been found. These occurred on more than 75,000 properties. Of these, 14,391,314 bushes and seedlings have been destroyed. A total of 2,283,368 barberry bushes and seedlings were found during 1926. All of these and some bushes and seedlings previously found were destroyed. The numbers of bushes and seedlings found and destroyed during this year are greater than for any other year of the barberry-eradication campaign. Additional millions of bushes and seedlings still remain scattered over the entire eradication area.

Although the campaign is not yet half finished, the removal of this great number of barberries is reducing stem-rust losses in the eradication area. In the eastern States of this area—Ohio, Indiana, Michigan, Illinois, and Wisconsin—the removal of barberry bushes has resulted in the disappearance of the severe local epidemics they caused. Stem-rust losses in general over these States also have been

materially reduced since the removal of these bushes. In other States of the barberry-eradication area the removal of barberry bushes has reduced the severity of local stem-rust epidemics and, although stem rust still occurs in damaging quantities, the removal of so many bushes has eliminated partially the source of stem-rust inoculum so that stem rust in this group of States now is less severe and appears considerably later than in former years. In these 13 States the average annual stem-rust loss of wheat for the period 1915 to 1926 was 33,169,833 bushels. The average annual loss of wheat in the first six years of this period (1915 to 1920) was 50,419,666 bushels, and for the second six years (1921 to 1926) was 15,920,000 bushels. These figures show a decided downward trend in stem-rust losses as a result of the destruction of barberries in this area.

LYNN D. HUTTON.

BEAN Standards Put Chief Kinds Under One Grading System

The commercial dry edible-bean crop of the United States returns to the farmers over $50,000,000 annually. In the preparation of this commodity for market certain specific operations are necessary in order that the quality may be brought up to the standard desired by various classes of consumers. Furthermore, a definite measure or description of quality is essential to the free interchange of beans in commerce.

The commercial standards of quality which have been used in the marketing of beans for years were developed by various State or regional bean-trade associations. Each association developed standards for the kinds or classes of beans produced in or shipped from its territory. These standards were drawn up each, for the most part, independently of the other. This resulted in lack of uniformity in grade designations and inconsistency in quality-factor interpretations.

After extensive studies by the Bureau of Agricultural Economics of conditions of production, marketing practices, and consumers' requirements in the bean industry as they relate to standardization, United States standards for beans were issued effective September 1, 1926. These standards comprise 19 commercial classes of beans and bring all of the principal kinds of commercial dry beans produced in the United States under a single system of grading, based on uniform and consistent interpretation of quality factors.

The test of any standard lies in its application. If it does not reflect accurately the quality of the product being graded it falls short of its purpose. The degree of accuracy with which a standard reflects quality depends not only upon the construction but upon its rigid and consistent application.

One of the prime objects of United States standards for beans is to insure consistent deliveries as to quality purchased. This can be more fully accomplished when such standards are uniformly applied under the supervision of a disinterested agency. To this end a Federal bean-inspection service was organized in October, 1926, for the purpose of providing inspection on the basis of the United States standards by men licensed by and under the supervision of the United States Department of Agriculture.

Adopted by Several States

Soon after these standards were issued they were adopted as the official State standards for Idaho, Montana, and Wyoming, and are being applied at shipping points by Federal licensed inspectors under cooperative agreements with those States. Federal inspection also is available at shipping points in Colorado and several terminal markets.

The purchase and sale of beans on the basis of United States standards applied by Federal inspectors is in its infancy, but its value is apparent to an increasing number of growers, distributors, and commercial consumers. Those now using the standards find that the Federal certificate of inspection, as evidence of the quality of the beans, stabilizes each transaction by eliminating risk to the seller and creating greater confidence on the part of the buyer in the quality and value of the beans bought.

In the United States standards there is a grade for each class or kind of beans representing the quality desired by each type of consumers. Uniformly designated and based on accurate and consistent interpretation of quality factors, each grade of a given class represents the same quality of beans in all markets regardless of source of production. As these standards become more widely used, and to that extent supersede existing regional standards, the marketing of this $50,000,000 food product is placed on a more confident basis.

J. E. Barr.

BEARS Sometimes Unjustly Blamed as Stock Killers Ever since the advent of domestic stock in our western country, bears, whether justly or unjustly, have been generally accused of having pernicious stock-killing tendencies. In this respect they are placed by many persons in the same category with the wolf, the mountain lion, and the coyote. General condemnation of all bears probably has its origin in the fact that early western pioneers in the stock business suffered severe losses of valuable cattle through onslaughts of grizzly bears. Consequently all bears, whether black, brown, or grizzly, have had the reputation of being stock killers. This public attitude toward bears persists to the present, and is apparent in widespread and often unjust accusations against these interesting forms of wild life.

A case in point, similar to many others coming to the attention of the department, was the death recently of 35 head of livestock on one cattle allotment of the Uncompahgre National Forest, Colo. At the same time that the owner discovered this loss, he noticed an abundance of bear tracks surrounding many of the carcasses. A request was immediately dispatched, through the forest supervisor to the district field office of the Bureau of Biological Survey, for a predatory-animal hunter to trap out the bears, as being undoubtedly the cause of this great loss. The hunter was detailed to the locality and made a careful preliminary investigation, which proved that the bears thought responsible for the destruction were only scavenging the carcasses of cattle that had died from larkspur-plant poisoning. As that particular season was a dry one, with a small wild-berry crop, the bears had gathered about the carcasses of the poisoned cattle in unusually large numbers.

An Occasional Bear is Guilty

Like bad men in the human family, however, there are individual bad bears that become notorious stock killers The eradication of

Fig 17 —Predatory animal hunter of the Bureau of Biological Survey tracking a stock killing bear in Wyoming prior to setting traps for its capture

these must be undertaken in the western range country whenever they get the habit of visiting the stock ranges. Very often individual grizzly bears are the worst offenders, though the black bear (in its brown phase) may become equally bad. At times when a bear has not had a profitable season and has obtained little fattening food, it hibernates intermittently during the late fall and throughout the winter in a very thin condition, and on coming from hibernation in spring is exceedingly poor and has a voracious appetite. If stock-killing tendencies

Fig 18 —Bear pen, with a single approach to the bait or lure, built by a Bureau of Biological Survey predatory-animal hunter The trap to be set in the pen is shown, chained to a toggle

are to develop, they are apt to become evident at this time. Many cases have come to the attention of predatory-animal hunters (fig. 17) of the Bureau of Biological Survey of bears that have begun to kill stock late in winter or early in spring. Once started, this habit is not abated because of abundance of other edible foods.' Having acquired a taste for beef or mutton, the bear prefers this to a diet of insects, acorns, berries, roots, or wild honey, its natural food.

The bear that has long obtained its livelihood at the expense of the stockman will seldom touch dead cattle until the carcass has cooled, generally a day after the killing. It starts its first meal on the viscera, following which it eats the meat. Ordinarily a long yearling or a sheep is the victim, but sometimes a bull weighing as much as 1,500 pounds will be attacked. The assault is commonly a heavy blow on the jaws, followed by a smashing attack across the small of the back, sometimes with such terrific force as to break the backbone and dismember the kidneys.

Persistent hunting will teach a bear to avoid trap, rifle, and poison, until it exhibits an intelligence that is often uncanny. Eradication of such marauders makes the Government hunter resort to all sorts of ingenious methods. Usually a stock-killing bear is baited to what is known as a "bear pen." (Fig. 18.) This is a stockade of poles or small logs so constructed that the bear can get to its tempting meal within by only one or two leads, either of which contains a carefully concealed trap, so placed as not to endanger human beings or valuable livestock. The animal when trapped is dispatched by the hunter.

FIG. 19.—Skin and skull of a notorious stock-killing bear taken on the west slope of the Hayden National Forest, near Victoria, Wyo., by Bureau of Biological Survey Predatory-Animal Hunter Skinner (shown in the picture)

The Bear a Game Animal

The Department of Agriculture considers the bear a game animal. The Bureau of Biological Survey has therefore instructed its predatory-animal hunters to make no general effort toward its control, excepting only those individuals known to be addicted to stock kill-

ing. (Fig. 19.) Before attempting to capture any individual bear, evidence that it is killing stock is first established as definitely as possible, and since 1917 the predatory-animal hunters of the department have been called upon to kill only 1,191 stock-killing bears throughout the entire West.

STANLEY P. YOUNG.

BEEF from Grass and Grain Gains Producers' Favor

It is not definitely known just how much of our beef supply is produced by grass. However, it is believed that approximately 65 per cent of the beef produced in this country can be attributed to the ranges and pastures. It may also be said that fully 50 per cent of the cattle slaughtered for beef have never received a grain-fattening ration.

There is a marked diversity of opinion on the quality of grass beef. Unquestionably the bulk of beef falling in the two top grades

FIG. 20.—Hereford yearlings from southwestern ranges being fed shelled corn and cottonseed meal on pasture in the Corn Belt

comes from the feed lot rather than the range or pasture. It is, however, not uncommon to see very desirable beef which has been produced on grass alone.

Grain-finished cattle command higher prices than those fattened entirely on grass. One reason for this is that some consumers believe it takes grain to put real finish on a carcass and are willing to pay for beef so finished. In reality the average consumer of beef at the present time can not distinguish between medium and choice beef with any degree of accuracy, and certainly is not in a position to make a distinction between a well-finished, grass-steer carcass and one of about equal condition having a grain finish. Finish or degree of fatness is primarily the deciding factor in determining slaughter-cattle values. Excessive finish, however, is not desired, because of waste in the carcass. The average purchaser of meat objects to buying cuts of meat having large amounts of fat. Granting that the most desirable condition for a carcass from the point of view of the packer and of the retailer can be obtained by a grain

ration, the question naturally arises as to the profit to the man who puts his cattle in this condition. Will it pay the range man with an abundance of grass and practically no fattening feeds to attempt to put a grain finish on his cattle? Obviously not.

The Corn-Belt area, having corn and hay crops particularly suited for fattening rations, should be depended upon largely for the bulk of highly finished beef. (Fig. 20.) There are certain localities, however, such as the irrigated valleys of the West, the rougher sections of the Corn Belt, and the Appalachian region (fig. 21) where the farms have considerable land devoted to both pasture and other crops, such as grain and hay. These conditions seem to be well adapted for the production of beef, possibly not so highly finished as that produced in the Corn-Belt dry lots but somewhat above the general run of strictly grass beef.

FIG. 21.—Angus yearlings on bluegrass pasture in the Appalachian region

There is an increasing tendency among cattlemen under conditions just mentioned to feed a supplement of grain or other concentrate to cattle on grass. (Fig. 22.) Corn alone or with cottonseed or linseed meal or cake is the most popular supplement used in this way. Such a practice makes it possible to obtain greater finish on the cattle in less time. This in turn results in earlier marketing, eliminating, to a large extent, competition with heavy runs of strictly grass-fat cattle toward the end of the grazing season. The value of supplements to pasture in cattle fattening depends somewhat on the condition of the pastures and the condition of the cattle when turned on grass. In the case of cattle that have been wintered well on grain and that carry considerable fat at time of going on grass, a grain supplement seems desirable. When grasses are nutritious and abundant, supplemental feed is perhaps not so important or necessary as when pastures are somewhat inferior.

Many of the State agricultural experiment stations, as well as the United States Department of Agriculture, are carrying on experiments to determine under what conditions supplements to grass are

most valuable. It is the consensus, based on experiments to date, that it pays to feed supplements to fattening cattle on grass, under farming conditions where pastures are good and fattening feeds available. The increased selling price of cattle which have received a supplement of grain on grass, as compared to that for strictly grass-fat cattle of the same quality, usually more than offsets the additional feed and labor costs.

A cooperative meat project, now under way, between the department and a number of the State agricultural experiment stations, covering a study of the factors which influence the quality and palatability of meats will perhaps show just what differences exist between strictly grass-finished and grass-grain-finished beef.

FIG. 22.—Shorthorn yearlings receiving a supplement of corn on pasture

W. H. BLACK.

BEEF from Young Stock of Quality Has Best Demand The influence of size and style of package on sales is well illustrated by the experience of the California raisin growers a few years ago. They were faced with overproduction and consequent low prices until some one conceived the idea of a 5-cent counter package of raisins and the slogan, "Have you had your iron to-day?" They proceeded to advertise and offer their product in the new form, and the result was that the crop was sold at better net prices than had been realized by previous smaller crops sold before this selling plan was used.

There are many other examples of catering to the changing needs or preferences of the trade. Quarter-pound sections of butter, 2-pound bags of flour, extremely small sizes of canned goods, all are attempts in that direction. They have resulted in greater sales and better-satisfied customers.

The same principle is now being applied to beef, with profit to the producer and merchant alike. Consumers of beef seldom want the

large steaks and roasts, with their risks of waste, but prefer light-weight cuts (fig. 23) that fit into present modes of living, such as apartment kitchenettes, greater variety in the diet, small families, a shorter day's work, and so on.

FIG. 23.—Prime-rib cut from a yearling. An attractive "on the block" package

Credit to Boys' and Girls' Clubs

Organized boys' and girls' club work was a pioneer in the field of baby-beef production (fig. 24) and must be given credit for introducing this commodity into many communities. The practice has gradually expanded. The product is now being produced on a commercial scale by many farmers. However, only recently has the system of full-feeding grain to beef calves during the suckling period come into vogue. By this plan grain-fin-

FIG. 24.—A club calf. An attractive "on the hoof" package

ished beef is produced with a minimum use of grain and the operator is able to make a more rapid turnover of operating capital. It is also in keeping with modern tendencies of efficiency in production, as indicated below. The relative costs of feed necessary to produce equal gains on calves, yearlings, 2-year-olds, and 3-year-olds, based on an official survey in the Corn Belt, were as follows: Calves, $1; yearlings, $1.05; 2-year-olds, $1.26; and 3-year-olds, $1.60.

There still remains a limited demand for heavy-carcass beef but it is easily met and an oversupply of it results in heavy penalties on all agencies involved in producing and marketing it. The bulk of the present-day trade wants beef from blocky, smooth, young animals which yield a high percentage of quality beef—in other words, from a small and attractive package. The up-to-date farmer who recognizes this fact and adjusts his beef-production operations accordingly is producing for a promising market outlet.

C. D. Lowe.

BEEF Raising from Grass Alone a Sound Practice in Ranching

Two important production areas remain in the Great Plains region that contribute the bulk of mature, grass-fat steers to the river markets, principally Kansas City and Omaha. The areas referred to are the Flint Hills of Kansas and the north plains, comprising the western parts of the Dakotas, eastern Montana, and Wyoming.

There are two natural basic requirements for finishing steers on grass alone. First, the range must have an abundance of good, fattening grasses and be favored normally with suitable climatic conditions for maturing it. Second, steers must be carried to 3 or 4 years old. In the earlier days steers were carried to 5 years and older before they were mature. Breed improvement has lessened considerably the time required.

Yearling and 2-year-old steers make good growth under favorable range conditions but do not harden into well-finished beef on grass alone. When sold at the river markets from the ranges at those ages, steers are often returned to the country for grain finishing. Approximately 80 per cent of well-bred 3-year-old steers on a good steer range will finish out under normal conditions. Practically, all well-bred 4-year-old steers will finish out.

Conditions Prevailing in the Areas

The Flint Hills area of Kansas is distinctly a finishing ground for grass-fat steers. The pastures are well watered. The usual rate of stocking the best ranges is one 3-year-old steer to approximately 4 acres of grazing land. The supply of steers comes chiefly from the near-by Southwestern States. The "in" movement begins about April 15. The "out" movement of steers (fig. 25) to market generally begins in July and reaches its peak in August and September. Good, summer-range conditions are the rule rather than the exception, but the grasses do not cure well for winter use in the area. Feed production is limited to comparatively small tracts of land, generally along creeks. The feed supply produced locally, however, is not sufficient,

to take care of the numbers of cattle that may be handled in the summer. These facts have been most influential in precluding breeding herds as a permanent system of operation and have reserved the area, in general, for fattening purposes.

FIG. 25.—A drove of highly finished grass cattle

A materially different condition prevails in the north plains, which is several times larger than the Flint Hills area. Some localities have been developed into distinct farming communities, in which cattle

FIG 26 —A typical cattle scene in the Great Plains area

production is secondary to crop production. In other localities of less desirable soil and climatic conditions, cattle production continues to be the principal enterprise (fig. 26) and crop production is largely confined to feed crops. During the last six years, especially, the sale

of feeder cattle from this area in particular has been advocated repeatedly as a means of getting greater ranch returns than finishing steers on grass. However, not all producers have taken up the practice of selling feeder instead of grass-finished cattle. In fact, many sales of feeder cattle may be attributed to indebtedness that demanded immediate liquidation and not to reorganization of the business for the purpose of selling feeder calves and yearlings.

Some Problems Confronting Producers

To apply the advocated practice of selling feeder instead of fat cattle, ranchmen were confronted with several problems of reorganization and operation. They were (1) to increase the numbers of cows so as to utilize the range as fully as under the system of finishing steers, (2) to increase feed production in proportion to the increase in the numbers of cows, (3) to decrease the probability of death losses, and (4) to reduce the number of cattle when necessary during critical years without seriously impairing the breeding power of their herds. Poor seasons and shortages of feed on ranches heavily stocked with cows in the area usually mean either the sacrifice of a part of the breeding herd or incurring the risk of heavy losses.

A study of selected cattle ranches in the area in 1926 indicated that (1) the smallest cash operating expense per head of cattle carried was on the ranches that finished steers on grass, (2) ranches that sold finished steers and lost money on the cattle enterprise were those that had few finished steers to sell as compared to the other classes of cattle, and (3) a higher per cent of ranches that sold feeder cattle lost money than those that finished steers.

Safe Ratio of Farming to Grazing Land

A combined study of the detailed land classification and agricultural experiment station results of the area indicates that the ratio of potentially safe farming land is much less than 1 acre—the acreage required to produce feed for one cow—to 20 acres of grazing land, the latter being acreage required to furnish grazing for one cow. Practical application of the foregoing information as a basis for determining probable trends in production indicates that if the grazing resources of the area are to be fully utilized by cattle, the excess grazing land must necessarily be utilized by classes of cattle that require the minimum amount of winter feed, or that crop production must be developed to convert much of the present grazing land to farming.

The interests of consumers must be considered in any production policy. The bulk of the beef as finished in the two areas mentioned is of good quality. On a tonnage basis it is produced more cheaply than grain-finished beef because of the small amount of expensive feeds that enter into its production. There is no feed cheaper than grass. Good-quality, grass-finished steer beef should yield proportionate profits to producers, packers, and dealers and be available to consumers at prices somewhat under those for grain-finished beef.

V. V. Parr.

BEEKEEPING, Still in Commercial Infancy, Aided by U. S. Grades Although comb honey in boxes had long been a commercial product, it was not until the invention of the centrifugal honey extractor in 1865 by D. Hruschka, of Venice, that honey in the liquid form, as we now have it, could be produced in large quantities. It was in the United States, however, a few years later, that the honey extractor was commercially developed by Moses Quinby and later by A. I. Root.

Moses Quinby is known as the "father of commercial beekeeping." He spent 25 years developing beekeeping to the dignity of a business, and succeeded in placing it on the same successful financial basis as other branches of agriculture. He produced as much as 500 pounds of honey from one colony in one season and sent as much as 30,000 pounds of honey annually to the New York markets, yet he did not become wealthy, because he spent much of his money in further investigation.

Since Quinby's time many changes in methods of production and marketing have taken place. At the present time there are United States standards for all grades of comb and extracted honey, while the enforcement of Federal and State laws relating to pure foods insures the consumer against the possibility of purchasing any but pure honey on any market in the United States.

Not only in the United States are the Federal standard honey graders in use, but they are used in New Zealand, and these instruments are located in Hamburg and London, as well as in ports of the United States, for the use of exporters and importers of honey. It is hoped that the use of these graders and of the standard honey grades will become international.

Increased Call for Granulated Honey

Under these conditions it is wisdom on the part of beekeepers of the United States to adopt systems of management for their bees which will result in producing honey of such a quality that the major portion of it will fall within the higher grades of the United States standards. The two chief commercial grades are Fancy and No. 1, both for comb and extracted honey. Extracted honey is largely marketed in the liquid form in glass, although there is a growing market for honey in the crystalline or granulated form, particularly among those who use much honey and who wish to avoid the undesirable stickiness of liquid honey. Crystallized honey, in tin cans, can be sold at a lower price than liquid honey in glass. It may be hard, or soft, depending on temperature, and may be spread on bread like butter. In Canada and some other countries crystallized honey is preferred; and when consumers in the United States become more familiar with its merits the market for honey in this form should be large.

Although the principles of beekeeping are well known, successful commercial beekeeping, resulting in good crops of a high-grade product, graded and packed and marketed on a par with other staple food products, is yet in its infancy. The pure food and drugs act of 1906, which almost insured the purity of honey, gave commercial beekeeping a great impetus. The general acceptance and use of the United States grades for honey, with proper attention to packing and

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marketing, ought to mark another epoch in the development of the industry.

The Division of Bee Culture, at Washington, D. C., is at the service of all honey producers or packers who wish help and information with reference to producing this wholesome food and placing it before the consumer in a form that will be attractive, as well as convenient for use.

E. L. SECHRIST.

BEES in Observation Hive Afford Unique Nature Study Medium It is doubtful if there exists in the whole animal kingdom another form of life which offers the advantage that the honeybee does as a medium for nature study. Every stage in the life of the bee is observable within the hive with the exception of mating, which takes place only on the wing. Not only can all stages in the life history of this useful insect be made visible at all times, but the rate of reproduction is so rapid that practically every phase of metamorphosis is present at any one time. Individual cells can be labeled and the daily development noted from the egg to the emergence of the adult bee; this requires only 21 days, giving the honeybee another great advantage as a subject for nature study. The thoraces of adult bees can be marked in bright colors, so that the activity of single bees can be watched and their lengths of life determined.

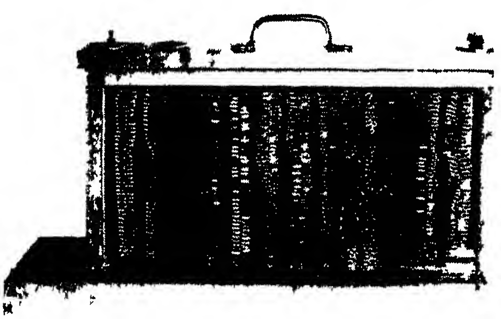

FIG 27.—Miller observation hive The various stages in the life history of the honeybee can be seen at all times through the glass walls.

During the past few years the Division of Bee Culture has been using, in connection with its studies on bee behavior, a type of honeybee-observation hive which seems to be well adapted for use in schools where nature study receives prominent consideration. This particular style of hive, known as the Miller observation hive (fig. 27), was described a number of years ago in the beekeeping literature, but for some unknown reason has not been used to any great extent.

Although a little more work is required for installing the Miller hive than for installing the ordinary single-frame glass hive, the Miller hive is so much easier to care for, and permits the observer to see so much more than can possibly be seen in the single-frame hive, that excellent use could be made of it in connection with the teaching of nature study.

The hive, as pictured in the illustration, has plate-glass walls with an air space between. The bottom, forming the base, is made wide and deep, to give clustering space to the bees and to allow ample room for ventilating the hive. Inside of the front portico are placed several queen-excluder wires which confine the queen to the brood

nest proper, but permit free passage of all worker bees. The top contains a convenient hole over which a wide-mouthed bottle may be inverted for feeding.

All Normal Activities Observable

Practically all of the activities common to normal colonies can be readily observed in such a hive without disturbing the bees. The arrangement of the narrow comb in the hive is such that the bees have utilized the glass to form the outside walls of the cells which lie directly against it. Thus it is possible to see everything that takes place within these particular glass-walled or windowed cells.

The egg-laying habits of the queen bee can be studied, as the passage of the egg from the tip of the queen's abdomen is visible and the manner in which it is fastened to the cell is readily discernible. Later, when the egg hatches, the habits and movements of the tiny larva are readily observable, and, what is of still more interest, the exact manner in which the nurse bees look after and feed the larva can be seen. Upon completion of the feeding period the larva can be seen spinning its almost invisible silken cocoon. Even after the cells have been entirely sealed from the outside, the movements of the larvae and pupae during their process of metamorphosis are constantly exposed to view.

Ordinarily what takes place within the darkened recess of the cell remains a mystery, but in these windowed cells many of the secrets of the hive are exposed. Thus can be seen the manner in which the field bees remove the large pellets of pollen and how later these masses are firmly compacted to economize space. The regurgitation of nectar and the process of ripening this thin sirup until it has become heavy mellow honey are demonstrated every day that bees are able to bring in nectar from the field.

Adult bees can be caught in the portico and their loads of pollen removed and examined under the microscope. At the same time, the pollen collected from flowers in the field can be examined and compared with that taken from the bees, and thus the bees' source of pollen can be determined. In a similar manner incoming bees can be divested of their liquid stores by gentle pressure on the abdomen, and thus nectar carriers and water carriers can be differentiated.

The hive itself is connected to the outside by a flexible cable, giving the bees constant access to the field. It is not necessary to cover the glass sides, as the bees become accustomed to the light and carry on as normally as though in a darkened hive. The bees are easily fed and cared for during the entire year, and the hive may be taken from place to place for the purpose of demonstration.

JAMES I. HAMBLETON.

BEETS Given Phosphate Make Larger Yields and Have More Sugar Extensive soil fertility experiments conducted in several different States and extending over a period of years give conclusive evidence that for practically all soils on which sugar beets are grown, phosphorus is the limiting element in the production of this crop. In these experiments it has been found that the applications of sufficient acid phosphate to

carry 80 pounds of phosphoric acid per acre have increased the yield of beets about 7 tons per acre, while the use of 80 pounds of ammonia has increased the yield by only about 1½ tons. Potash used alone at the rate of 80 pounds to the acre has given approximately the same yield as the unfertilized. When either ammonia or potash has been substituted for one-fifth of the phosphate, the yields have been slightly lower than where phosphate was used alone. It is probable, however, that after the needed phosphorus has been fully supplied, the yields can be still further increased by additions of potash or ammonia. Large commercial field plantings as well as some of the experimental fields have shown that even as small an application as 125 pounds per acre of 16 per cent superphosphate (acid phosphate) will give very profitable increases. The beneficial effect of the phosphorus

FIG. 28.—Early start made by sugar beets which have been fertilized with phosphate fertilizer, as compared with beets not fertilized

is most marked early in the season, thus indicating that the good results are due mainly to the early start this fertilizer gives the plant. The views shown in Figure 28 were taken in July in three different years and in three different States. These photographs show the early start made by the beets fed with phosphorus as compared with those which received no commercial fertilizer. The wide differences in leaf growth shown in the early stages are not always so apparent later in the season.

The photograph shown in Figure 29 illustrates not only a difference in yield but also difference in the size of the roots produced on the fertilized and unfertilized areas. In addition to the increased yields the beets from the fertilized plots are from 1 to 2 per cent sweeter than those where no fertilizer was used. The low cost of the

FIG. 29.—To the right, beet fertilized with 400 pounds of 16 per cent superphosphate (acid phosphate) per acre (yield, 27,714 pounds an acre). To left, beets unfertilized (yield, 12,759 pounds an acre)

phosphate fertilizer and the fact that it is easily applied are also factors which favor the use of phosphates in certain sugar beet growing districts.

LEWIS A. HURST.

BIRD Banding Tells Biological Survey of Migration Behavior Thousands of wild birds are being banded every year throughout the United States and Canada under the direction of the Bureau of Biological Survey. The work is done by volunteer cooperators, especially licensed for the purpose under the provisions of the migratory-bird treaty act, and knowledge of the migratory and other habits of birds is thus measurably advanced. The gross results of the efforts of about 1,200 persons now engaged in this method of research have been the banding of more than 350,000 birds, and return records exceeding 15,000. Numbered aluminum bands are furnished by the Bureau of Biological Survey, and the original banding records from all trapping stations and information regarding retakings (returns) are sent to the files of that office.

Banding cooperators are obtaining much important and interesting information at their own stations concerning the movements of birds, their times of arrival and departure, and the limited area over which many of them roam during summer and winter. Constantly increasing numbers of banded birds also are being reported from other points, thus making possible definite statements regarding the routes followed in migration and the time required for the journeys. (Fig. 30.)

Through the agency of the great numbers of hunters who spend part of each open season in the duck marshes, banded waterfowl are yielding a high percentage of the returns. A fact of peculiar significance developed is that in the United States it is rare for a duck banded in the Mississippi Valley or eastward to cross the one-hundredth meridian of west longitude, and conversely, a duck banded in the Great Basin or on the Pacific coast rarely goes east of central

Nebraska, Kansas, and Texas, through which States this meridian passes. In the Prairie Provinces of Canada ducks from both the east and the west may share common breeding grounds, but when the time for migration arrives, each group seems to withdraw to its own chosen section of the southland. The determination of this fact is of importance as showing that although a species may be

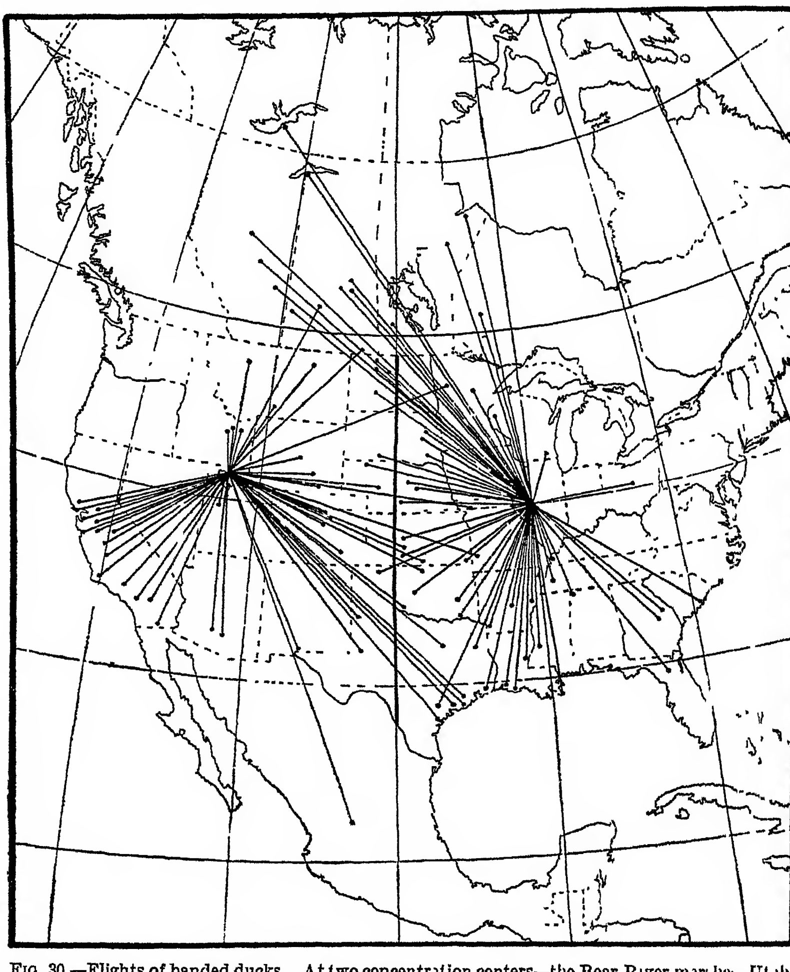

FIG. 30.—Flights of banded ducks. At two concentration centers—the Bear River marshes, Utah, and the Illinois River marshes, Ill.—bands were placed on about 6,000 ducks, and several hundred of these have been recovered. Only the outlying points of recovery are shown on this map, but it will be seen that very few of the banded ducks crossed the heavy black line representing the one-hundredth meridian except on breeding grounds in Canada

abundant in the Mississippi Valley and on the Atlantic coast, it can not be depended upon to replenish waterfowl areas that have been greatly depopulated through unwise drainage or alkali poisoning.

Habits of Herring Gulls

Remarkable flight habits have been noted by banding herring gulls, one of which is that birds have been found during the first six months

of their lives to wander in almost any direction. Young birds banded in the large gull colonies in northern Lake Michigan have gone directly north into southern Canada, have followed the Great Lakes and the St. Lawrence River to the Atlantic Ocean, and have moved gradually southward. That they are capable of prolonged flight is shown by the records of birds retaken on the Gulf coast and as far south in Mexico as Vera Cruz.

Return records show that Caspian terns also banded on Lake Michigan (fig. 31) make long migratory flights, individuals having been retaken south through the Mississippi Valley to the Gulf, and on the Atlantic coast south of Chesapeake Bay to Key West, Fla., and a few at the mouth of the Magdalena River, in Colombia, South America. Curiously enough, three of these birds were recovered in Nova Scotia in the season succeeding that of banding. As they probably do not breed until they are 2 or 3 years old, it is likely

FIG. 31.—About 800 young Caspian terns driven into a corral for banding at a breeding colony in northern Lake Michigan

that the Nova Scotia individuals had moved north in company with members of another colony rather than with those of the parent colony in Lake Michigan.

Herons of various kinds banded in large numbers have likewise been productive of valuable and interesting return records. Several species have the curious habit of moving northward after the breeding season, sometimes making extensive flights before heading southward with the advent of cold weather. An example is shown in return records of black-crowned night herons banded at a colony on Cape Cod, Mass., the young of which, on leaving their nests, scattered in all directions, many going north as far as southern Ontario and Quebec and west to western New York and Michigan. With the approach of winter they were driven south, and the returns show their route through Pennsylvania, Virginia, North Carolina, and Georgia, to Florida, Louisiana, Cuba, Haiti, and Jamaica. A record flight is found in the case of a young great blue heron banded in

central Minnesota and recovered three months later at Gatun Lake, Panama.

The majority of the bird-banding cooperators are concerned chiefly with the smaller birds that are readily attracted to backyard trapping stations. These birds, however, occasionally yield return records of exceptional interest. Noteworthy are two purple finches, one of which, banded at Norwalk, Conn., was retaken at Haynesville, La., and the other, banded at Peterboro, N. H., was recovered at Thornton, Tex. A few other birds of this species, banded at Sault Ste. Marie, Mich., were recovered at points in Tennessee and Arkansas; and a white-crowned sparrow, banded at Seattle, Wash., was retaken at Watsonville, Calif.

FREDERICK C. LINCOLN.

BIRD Refuges to Protect Waterfowl Urgently Required The necessity for establishing more migratory-bird refuges throughout the United States is real and immediate. Suitable areas of land and water are being rapidly taken over by private interests for ducking clubs, while at the same time hundreds of thousands of acres of marshland, valuable

FIG. 32.—Flight of pintail, widgeon, and mallard ducks on Butte Creek, Sutter County, Calif., January, 1924. Legal protection for these birds will be of little avail if their feeding, breeding, and resting grounds are not preserved

as homes for wild life, where migratory birds have been accustomed to rest and breed and feed undisturbed, are being drained for agricultural purposes.

As civilization advances, bringing with it improved firearms and better transportation facilities, the birds find more and more difficulty in locating safe places to feed and propagate. In proportion as the areas formerly occupied are drained or acquired for shooting or other purposes, the need for setting aside in perpetuity suitable tracts to serve as wild-fowl sanctuaries becomes more urgent. By immediate establishment of Federal and State refuges alone can we hope to perpetuate the wild waterfowl of America. (Fig. 32.)

Canada, by the establishment of refuges, has gone far toward meeting its obligations as defined under the treaty between this country and Great Britain for the protection of the birds that migrate between the United States and the Provinces. Most of the wild ducks and geese breed in Canada, but more and more are nesting within the United States each year since the enactment of the Federal bird law prohibiting spring shooting. Refuges, therefore, are vitally necessary to protect the birds that nest in both countries and winter in the United States. (Fig. 33.)

Our northern neighbor has already established 89 refuges frequented by ducks and geese covering more than 1,500 square miles of land and water, and is constantly adding more refuges to those already created; in addition, there are many hundreds of square miles in Canada

FIG 33.—Mallard duck and her young amid surroundings such as are essential for breeding and feeding

included in private and Provincial refuges and national parks, and areas of vast extent still untouched by human settlement.

The United States Department of Agriculture, through the Bureau of Biological Survey, controls existing Federal refuges frequented by waterfowl, covering approximately 450,000 acres, or about 700 square miles, also bird refuges in Alaska, Hawaii, and Porto Rico. Under conditions of ever increasing density of human population, many more refuges are needed, particularly in the former concentration areas of wild fowl.

Ground Suitable for Refuges

Arid ground unsuitable for agriculture or other economic uses can sometimes be turned into wild-fowl refuges by flooding, through the erection of dikes constructed at comparatively small cost. An example of this may be seen in the Bear River marshes of Utah, where large alkali areas, which have been seriously injurious to waterfowl, may

be turned into bird havens by the construction of dikes to hold back and impound fresh waters. Reflooding drained areas found to be unfit for agriculture will also supply additional places where ducks may rest and feed undisturbed. Such projects invariably benefit more than one State, and in a general sense fall into that class of reclamation work properly undertaken by the Federal Government.

If we would save our migratory wild fowl for posterity, and fulfill the promise that the Nation has made to Canada, adequate funds for obtaining and maintaining additional areas of land and marsh and water for bird refuges must be provided without further delay.

TALBOTT DENMEAD.

BLISTER Rust of White Pine Invades the Pacific Northwest

The white-pine blister rust, a destructive disease of the white pines, is now firmly established in western North America and is spreading by natural means much the same as it did in the eastern United States following its introduction from Europe. The rust is chiefly destructive to its white-pine host, but it does not spread from pine to pine, and it can not attack the pines except by spores produced on the leaves of currant or gooseberry bushes, the so-called alternate host plants of this disease.

The ranges of the three commercial white-pine species in the United States are geographically separated into two belts. The eastern white-pine belt, extending from Maine to Minnesota and southward to Georgia, is separated by the Great Plains from the western white-pine and the sugar-pine belts of the West. The western white pine begins in Montana and extends west to the Pacific coast, through Idaho and Washington and southward through Oregon and California. The sugar pine begins in Oregon and extends through California. The principal area of western white pine comprises northwestern Montana, northern Idaho, and northeastern Washington, while the sugar pine is found chiefly in the Coast and Sierra Nevada Ranges of California.

The rust was first found in the United States at Geneva, N. Y., in 1906, although it was introduced about 1900. Investigations from 1906 to 1916 showed that it had become so widely established in the northern part of the eastern white-pine region that its extermination there was impossible. In 1917 the United States Department of Agriculture established a quarantine line through the Mississippi Valley preventing further westward movement of dangerous host plants from the eastern white-pine region. This measure has effectively prevented the spread of the rust westward through the United States.

Introduced into Canada

However, it was introduced into British Columbia on small white-pine trees from Europe planted near Vancouver about 1910. Its presence in the West was first discovered near Vancouver, B. C., in 1921. Immediate investigation showed that it was already generally established in western British Columbia and that it had spread into the coastal region of Washington. Since then the spread of the rust has been traced southward through the Pacific coast and Cascade regions of Washington into northern Oregon and eastward in Washington and British Columbia across the dry belt into the western margin of the chief western white-pine areas. While the systematic

elimination of the European black currant (cultivated black currant), a principal host plant of the rust, which has been carried on throughout these States since 1921, has greatly delayed its progress, this rate of spreading indicates that the rust will become established in the chief western white-pine forest areas during the next few years and will also continue its advance toward the sugar-pine forests.

The present merchantable western white and sugar pines have an aggregate standing-timber value of approximately $322,500,000. In addition, the young stands of these species have great potential values in future forests. These important forest trees can be assured in the future against damage from the blister rust only by effectively applying control measures. The control of the disease is accomplished by systematically destroying the currant and gooseberry bushes within and near the pine stands. Experiments conducted in the western forests during the last four years indicate that this can be done at a cost sufficiently low to be economically feasible. Areas on which these bushes are generally scattered are systematically worked in parallel strips by crews of men walking abreast and pulling out the bushes by hand or uprooting them by the use of a mattock. On some areas where there is a great profusion of wild currants and gooseberries it has been found that the work can be done more thoroughly and cheaply by killing the bushes with a chemical spray. Progress made during the last two years in determining the toxic effects of different chemicals on currant and gooseberry plants and in developing methods of application are very encouraging and under certain conditions promise to reduce the costs greatly below those of hand pulling or grubbing. The department and the States concerned are cooperating in a program of work to perfect these local control practices and to secure their application before severe damage is caused by the rust.

G. B. Posey.

BLISTER Rust Spread by Wild Gooseberry and Currant Bushes Wild currants and gooseberries are dangerous weeds wherever white pine is an important crop, because they spread the white-pine blister rust. This destructive disease is caused by a parasitic fungus that lives alternately on the white pine and the leaves of currants and gooseberries. It was introduced from Europe about 1900 and in the East is now present in the New England States, New York, New Jersey, Pennsylvania, Michigan, Wisconsin, and Minnesota.

Blister rust can not spread directly from one pine to another. From diseased white pines it spreads to currant and gooseberry leaves for distances up to 100 miles or more by means of wind-carried spores. After growing in the leaves for a short time, the fungus produces the spores which carry the disease back to the pines. These spores are spread by the wind, but they are so delicate and consequently short lived that only pines within a short distance of the diseased bushes become infected. This makes it possible to control the disease locally by destroying all currants and gooseberries within infecting distance of the pines. This distance varies with local conditions, but in eastern forests 900 feet is considered sufficient to give adequate protection to the pine.

Some Worthless Species

In the eastern United States there are several species of wild currants and gooseberries which are worthless as crop plants. As a group they are adapted to a wide range of growth conditions. Some thrive in swampy places, while others grow in drier sites. Usually one or more species are present in places where white pines are native, although in some localities they may be entirely absent. Most of these plants can be recognized by their general resemblance to the common garden varieties of currants and gooseberries, with which most people are familiar. The skunk currant is an exception and might not be recognized because of its trailing habit of growth. However, the leaves of this plant are similar to those of other currants and when crushed give off a disagreeable skunklike odor by which it may be identified.

Blister rust does not materially injure currants and gooseberries, but it kills pines of all sizes. The smaller the trees, the sooner they die. In many local pine areas where the disease has been present for several years, from 50 to 100 per cent of the trees are dead or dying. Within the infected regions the disease may prevent natural restocking of pine in unprotected areas by killing the young trees soon after they appear. The disease is very deceptive and does not attract attention until the affected portions of the trees begin to die. Injury is first indicated by the presence of dead and dying branches. Later, the trunks are girdled and the trees die. Usually pines with old infections are characterized by dead and dying branches, broken-off tops, and diseased areas on the trunks which are covered with pitch.

White Pine an Important Timber Tree

White pine is one of the most important timber trees in the eastern United States because of its adaptability to forest management, its wide range, rapid growth, high yield, and excellent wood. The value of the trees as they stand in the forest is estimated at $225,750,000. In addition there is a large acreage of young pine which will become valuable timber in the future. In order to protect this valuable crop from blister rust and assure its continued production, the United States Department of Agriculture and the affected States in which eastern white pine is an important forest tree are jointly prosecuting a campaign to control this destructive disease. Owners of white-pine stands are urged to safeguard their trees by eradicating the currants and gooseberries within 900 feet. One thorough working of an area will protect the pines for five or more years, after which the work may have to be repeated to enable the pine crop to reach maturity safely. Wild currants and gooseberries are now generally recognized as undesirable weeds and are being destroyed on over 800,000 acres per year in New England and New York, where the cooperative control campaign of the Federal department and the State agencies is making rapid progress.

J. F. Martin.

BOOK Lists Prepared in the Department Aid Economic Studies The wise investigator, before attacking any farm problem that is new to him, turns first to the book shelf to learn what others have done on the subject. This saves him much time and effort, saves duplication and waste. It gives the investigator a chance to take advantage of everything that has been done and reported on the problem, and enables him to begin just where others have left off and to push his work into new phases of the problem.

The bibliographies or descriptive book lists prepared in the library of the Bureau of Agricultural Economics are planned especially to provide the materials for this quantitative investigation of the economic problems of agriculture.

Among these problems is the question of how the American farmer can be relieved from the evils which a surplus of a crop which he raises inevitably brings upon him. One of the answers given in some quarters is that Government control of all export and import, or of the export and import of certain commodities, would solve the problem and assure a fair price to the farmer. Has such a plan ever been tried; and if so, did it succeed or fail?

In trying to supply the materials for an answer to the first half of this question, the library compiled a bibliography entitled "Government Control of Export and Import in Foreign Countries," and found that 61 countries had tried to solve the problem of a surplus production by more or less control of export and import. More than 400 definite references to the many ways in which this has been done were collected, listed, and abstracted or annotated. Those who believe that a plan of action can best be evolved by studying the way in which similar plans have worked elsewhere now have the material for such study. (Agricultural Economics Bibliography No. 12).

Other sincere students of the farmers' difficulties, because of the ever-recurring surplus, think that if there were a well-worked-out system of bounties, drawbacks, subsidies, or premiums the difficulty would be overcome. The library has prepared a bibliography entitled "Bounties on Agricultural Products" (Agricultural Economics Bibliography No. 20), which shows that 60 countries, including the United States, have used variants of the bounty plan. Forty-two of our States, Territories, and insular possessions have used this plan at some time. More than 300 annotated references to the exact location of information on the subject are given in the bibliography.

Bibliography on Price Fixing

Other plans to relieve the farmers' troubles include governmental fixing of prices. On this subject a bibliography containing 492 references has been compiled, entitled "Price Fixing by Governments, 424 B. C.–1926 A. D." (Agricultural Economics Bibliography No. 18).

Another much discussed proposal for relief is by the control of agricultural production. A bibliography devoted to this subject will be available early in 1928. Many of the exponents of this plan of relief may be surprised to know for how long and by how many governments attempts have been made to control production. The

colonial United States, especially Virginia and Maryland, tried some kind of production control over and over again. Many foreign countries have tried it with varying degrees of success. These instances have been collected, arranged by the commodity to which the method has been applied, and indexed by country, so that the subject may be studied either by commodity or geographically.

Another group of bibliographies is being worked out on the economic aspects of the specialized fields of agricultural production. For instance, Agricultural Economics Bibliography No. 19 is called "The Apple Industry in the United States—A Selected List of References on the Economic Aspects of the Industry Together With Some References on Varieties." This was compiled at the request of those in charge of the recent survey of the apple industry in the United States and was widely distributed to the investigators in the field. A similar bibliography on the peach industry in the United States (Agricultural Economics Bibliography No. 8) is available and one on the poultry industry is nearing completion.

Indexing of State Sources

Another type of work in which the library is engaged, with the cooperation of the States concerned, is the indexing of the State official sources of the agricultural statistics of the various States. Such indexes have been finished for Alabama (Agricultural Economics Bibliography No. 15) and Oklahoma (Agricultural Economics Bibliography No. 21). The latter contains 460 pages and is a compendium of sources for the agricultural statistics of Oklahoma, which will save an enormous amount of time to economic investigators and should do much to insure that the activities and studies of all the forces working for the improvement of agriculture be determined by facts and be based on such statistics as exist.

The index for California is nearing completion. It will probably be at least twice the size of the Oklahoma index owing to the great variety of agricultural commodities produced in that State. In connection with a study of the nut industry of California, the library was asked to copy off the references in the California index relating to the sources of the statistics of walnuts in that State. It was found that the index contained 210 definite references to sources of walnut statistics, although the index is not completed.

It is believed that these indexes will bring to light the economic facts bearing on an agricultural area which, if properly studied and presented, will give a basis for sound, constructive long-time programs for the improvement of agriculture.

Mary G. Lacy.

Boys' and Girls' Clubs Do Pioneer Work in Improving Farm Life

Boys' and girls' 4-H clubs are an integral part of cooperative extension work as carried on by the United States Department of Agriculture and the State agricultural colleges. The purpose of this work is to take the scientific facts discovered in the laboratories and on the experiment stations of the department and the colleges and the best agricultural practices found anywhere in the country to men, women, boys, and girls on the farm. These facts are demonstrated and the

practices put to use by the individual who agrees to become a demonstrator. Among the boys and girls of the United States there are at this time more than 600,000 demonstrators. These boys and girls are organized into clubs called 4-H clubs. They take their name from their emblem, which is a four-leaf clover with an H on each leaf. These H's stand for the training of the head to think clearly, the hands to execute the thoughts of the head, the heart to sympathize and feel for others, and the health for better living. Their motto is "To make the best better"

They demonstrate the growing of crops, livestock, home improvement and beautification, canning, sewing, cooking, etc., according to the needs of their respective communities. (Fig. 34.) Every legitimate member of these clubs conserves, preserves, or produces

FIG. 34 —A Utah club member in his sugar-beet field

something of economic value. This differentiates these clubs from other boys' and girls' organizations.

The ages of club members are from 10 to 20 years, inclusive. These are critical years in the life of a boy or girl. The habits formed and the ways of doing things during these years cling to them with tenacity during the remainder of their lives. This great army of young people, trained in improved farm and home activities, has had a marked effect upon the agriculture of our country. (Fig. 35.) This has been particularly true of improved crop production. The following instances of the influence these clubs have had on crop production throughout the United States are typical.

4-H Clubs in Alabama

The farms in Coosa and northwestern Tallapoosa Counties, Ala., are small and hilly. Cotton is primarily the cash crop of the people.

In 1923, because of the low price of cotton and a heavy infestation of the boll weevil, the people became discouraged. Little interest was being taken in farming operations. The county agent, Sam Day, realized that extension work had become almost an impossible task and that something must be done to arouse the interest of the people. He recalled how farm boys in the early days of extension work responded to the call of S. A. Knapp to demonstrate that corn could be grown in the South. In 1924 he called a meeting of business men to outline a plan for producing a bale of cotton to the acre. The business men readily agreed to supply the farm boys, who would enroll in cotton club work, with pure seed, fertilizer, and poison to destroy the boll weevil. Mr Day had the 142 boys who enrolled use the Auburn maximum method of fertilization—400 pounds of superphosphate (acid phosphate), 200 pounds of nitrate of soda, and

FIG 35.—A Georgia peanut-club member and his county agricultural agent examining his crop

50 pounds of muriate of potash to the acre. This formula is recommended by the experiment station of the Alabama Polytechnic Institute.

The boys followed Mr. Day's instructions in the preparation of the land, the planting of seed, the cultivation and the harvesting of the crop. At the end of the year it was found that the average production by the 142 boys was 1,042 pounds of seed cotton. Seventy-nine of the boys had made 79 bales of 500 pounds each of lint cotton on 79 acres, while the average for the county was less than 150 pounds of lint cotton per acre. In 1925 the business people were eager to finance the boys under the plan used in 1924. The same method of growing cotton was followed. Two hundred and thirty-five boys reported an average of 1,013 pounds of seed cotton per acre, 118 of them making 118 bales on 118 acres. These bales averaged 504 pounds of lint cotton each.

Boys' Example Followed by Fathers

The work done by these boys gained wide publicity throughout the counties and their fathers desired to try the plans used by the boys. In 1926, 155 boys made 155 bales of cotton averaging over 500 pounds of lint cotton each on 155 acres. Fifty of the fathers, pursuing the same methods as the boys, agreed to plant 5 acres each. At the end of the year the fathers had made 250 bales of cotton on 250 acres. It took two years to prove to the farmers that a bale of cotton per acre could be grown on their land.

Through the demonstrations made by these boys interest has been aroused in farming, the farmers are terracing their land, using better methods of fertilization and soil building, getting better livestock, and providing more education for their children. Mr. Day, in commenting on the results, said:

> The best part of this club work is that it has shown the way to higher education and has helped create in the boy or girl a desire for the better things of life. Eight boys and one girl, who were in club work in 1925, entered college. Club work is primarily responsible for some of them being in college. There is a vision in club work for all of us to get. Our experience shows that the boys and girls of the agricultural clubs make better farmers and stronger community leaders than those who have had no club training.

In 1925 a survey made of the potato industry in Lyon County, Nev., showed that this important industry was being jeopardized by poor seed. This county ships about 450 cars of potatoes annually. Upon investigation it was found that good certified seed was difficult to obtain and it was decided to make an attempt to grow seed potatoes. A club of boys was organized and good stock obtained. The boys planted their seed late, July 4 to 8, and cared for them in about the same manner as the main crop. Careful data were kept and the only additional labor cost attached to this project was the roguing of the fields. The parents of the boys became greatly interested and when the seed was harvested and stored an exhibit was made which created favorable comment.

An Example in Pennsylvania

In 1926 in Lycoming County, Pa., a boys' club put on a demonstration of the best practices in potato production. The club secured seed free from disease which they planted under direction of the county agent, W. H. Van Sant. Through the summer they kept their spray machines and cultivators going, and excellent yields were obtained. The average number of bushels made by the boys was 336 at a cost of 42.3 cents per bushel, while the average made by the farmers of the country for the last three years was 132 bushels at a cost of 93½ cents per bushel. Mr. Van Sant said:

> As the result of this demonstration the sale of seed potatoes free from disease was increased in Lycoming County. Farmers, seeing the results of spraying, have purchased new spray rigs, and those who have machines are doing a better job of spraying than was ever done before.

Some years ago it was found that the production of early Triumph potatoes in Louisiana was declining rapidly, due largely to the presence of the mosaic disease. The use of the best certified seed showed that a good crop of Triumph potatoes could still be made in Louisiana, and the problem before the horticultural department of the

agricultural college was to get this information to the growers of potatoes. It was decided to use the boys' and girls' clubs as a medium to distribute this information. Three carloads of certified Triumph seed potatoes were obtained, and 10,000 2-pound bags of sulphate of ammonia were donated by an educational committee. The material was shipped to Baton Rouge and distributed among nine to ten thousand boys and girls through the county and home demonstration agents. The press of the State was liberal in giving publicity to the activity, the value of certified seed was shown, and the potato industry not only was saved but is increasing in the State.

In 1912 a club was organized at Doran, Colquitt County, Ga. The president of this club was W. W. King. As a club boy Mr. King made 53 bushels of corn on his acre. In 1927 the extension

FIG. 36.—Iowa corn-club members learning to select seed corn at a field meeting

agent who had organized the club in 1912 visited this boy, who is now a successful farmer. On the acre on which he had grown his corn in 1912 he is now growing hogs under sanitary methods, and his farm is visited by thousands of people from different parts of the State every year. Mr. King grows purebred hogs, purebred dairy cattle, and standard-bred chickens. He raises all of his feed crops for his hogs, dairy cattle, and chickens. On an acre near by his son, about 13 years old, is growing corn as a member of the corn club this year.

Clubs Introduce Pure Seed

The 4-H club members have done much toward introducing pure seed into use in every section of the country. (Fig. 36.) An outstanding example of this comes from Kansas. The Pride of Saline

corn is a variety originated in western Kansas. It has proved to be the best variety for the larger part of the corn-growing district. The farmers in Marshall County hesitated to make a change. The corn-club program was sponsored by bankers and elevator companies. These organizations furnished 350 club members with seed corn. It required only two years of club demonstrations to convince the farmers of the county that no other corn compared with Pride of Saline.

The county agent in Graves County, Ky., induced William Rhodes, a club member, to lime a half acre of land and use a sack of 16 per cent superphosphate (acid phosphate) in making a demonstration in the growing of tobacco, with the idea of following this crop with sweet clover or alfalfa. The boy was the first individual in that part of Graves County to use superphosphate and lime in growing tobacco. The result of his demonstration was that he had a yield on his half acre of 825 pounds. On the check half acre adjoining William's there was no treatment and no particular care given to the crop. The yield was approximately half that William obtained on his half acre. He received 15 cents per pound for his entire crop. The average price received for the crop on the check half acre was 4.2 cents. As the result of this demonstration many of the farmers in the community are fertilizing their tobacco, planting less, and taking better care of it.

Equally as good work has been done by club members in livestock. Wherever clubs have been organized great changes have been made in the feeding, breeding, and management of pigs, sheep, cattle, and poultry.

Girls' Work in Home Activities

The greater portion of the activities of girls has been within the home rather than with farm crops, and the influence of these activities can not be so easily traced. Their work makes for health and happiness on the farm. Thousands of homes, because of club work, have a full supply of canned vegetables and fruit for winter use The burdens on the tired shoulders of the mother have been lightened by the partnership of her daughter in the performance of household duties. The daughter has taken over a large portion of the baking and sewing of the household. Club work has led the way in beautification of homes, the installation of modern conveniences, and the feeding of a balanced diet to the family.

Club work has been a potent influence in the improvement of agriculture and home making throughout the United States, and, as the examples given indicate, club members have made a large contribution to improved crop production.

I. W. Hill.

Boys' and Girls' 4-H Club Members Attend First National Camp

"It has been the most eventful week of my life. It will continue to be an inspiration to me as long as I live. I go home with a new idea of the service that the Government performs for the people." Thus spoke Ruth Davis, a club delegate from Nebraska, on the last evening of the first national 4-H club camp held in Washington, D. C., June 16 to 23, 1927. The camp was attended by 142 4-H club members, rep-

resenting 38 States, 68 State and county club agents, and by representatives of the United States Department of Agriculture. (Fig. 37)

Delegates to the camp were the outstanding leaders among the 600,000 members of 4-H clubs Fifty thousand of these clubs are organized in the 48 States under the direction of the cooperative extension service with an adult local leader in charge of each group. They have pledged themselves to demonstrate improved practices

FIG 37 —Flag raising at the national 4-H club camp on the grounds of the Department of Agriculture

on the farm and in the home through an enterprise such as the growing of an acre of cotton, the feeding of a pig, the canning of the family food supply, or the improvement of the farm home. The clubs meet regularly under the direction of their local leaders. They learn parliamentary procedure. They learn to work together, to play together, and to have a fuller appreciation of the country and the opportunities it offers to make a life while earning a living.

Object of the Camp

The object of the national 4-H club camp was to bring together the most outstanding of these club members and to give them an opportunity to interchange ideas that they might give the young people in their communities more effective leadership. The program was designed to develop leadership, recreation, and citizenship. A meeting was held each afternoon in the auditorium of the National Museum, at which some instruction was given in such matters as recreation, use of illustrative material, how to make a talk, and the philosophy of play. Most of the assembly period was devoted to discussions by the club members themselves. For convenience six discussion groups were formed, each having an adult State leader as adviser. A chairman and a secretary were selected.

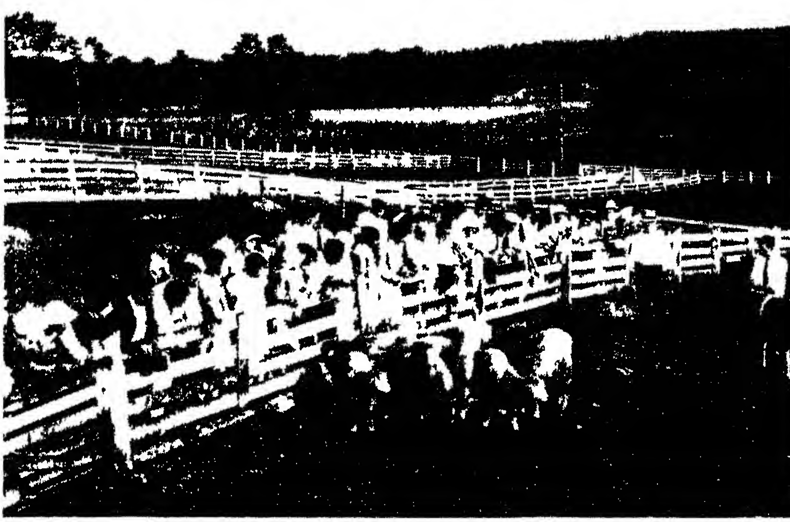

FIG 38.—Delegates to the national 4-H club camp studying sheep at the experimental farm at Beltsville, Md

The conference worked rapidly. Little time was allowed for formal papers and speeches. A statement of the objectives of 4-H club work was formulated. A standard pledge was selected and the motto approved. Committees on club standardization, uniforms, songs, pins, emblems, and medals were appointed and requested to report at the 1928 conference. The delegates were intensely interested in the work of the Department of Agriculture. (Fig. 37.) The Secretary of Agriculture, W. M. Jardine, visited the camp and presented each boy and girl with a gavel, the head of which was made from wood taken from the White House when it was remodeled in 1927 and the handle from a hickory log from the grounds of Mount Vernon. The Secretary welcomed the boys and girls to Washington and spoke of the work of the 4-H clubs.

Recreation, tours (figs. 38 and 39), inspirational lectures, citizenship, all found a place during the week of the camp. The meetings of leaders and club members brought about an interchange of ideas

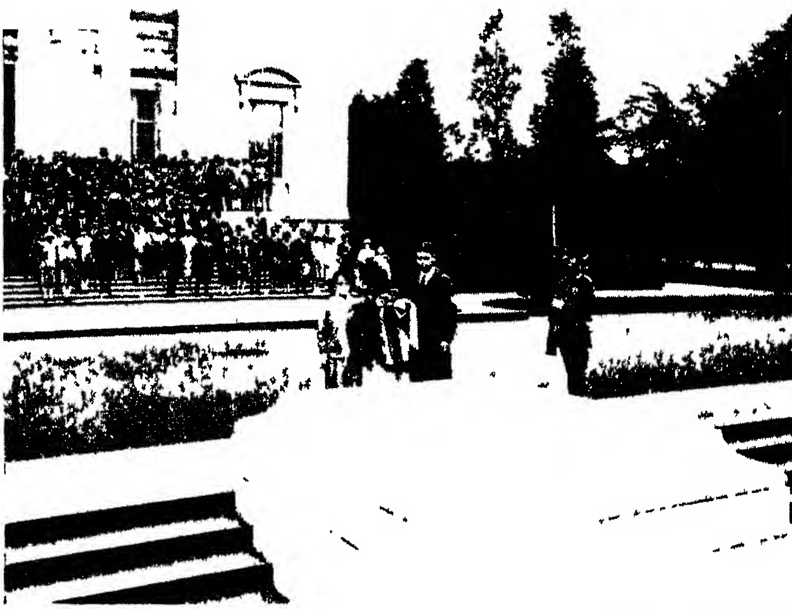

FIG 39 —Two representatives of the national 4-H club camp placing a wreath on the Tomb of the Unknown Soldier in Arlington Cemetery

that manifests itself in better club work and more efficient leadership. Their contacts in Washington sent the young people home with a feeling that the Government was their Government, administered by men and women with a sympathetic understanding of the conditions and problems of farm life.

GEORGE E. FARRELL.

BROOMCORN Marketing Under U. S. Standards Has Many Advantages

During the early period of broomcorn marketing in this country Federal inspection for broomcorn was not so essential as it now is. Buyers then could visit near-by producing territory at little or no expense, could personally examine and select the broomcorn they wanted, and pay for their purchase. These simple marketing methods served for the distribution of the crop. Since then, however, production has gradually shifted westward from the eastern sections of New York and adjoining States. First it shifted to Ohio and Illinois and then to the new and cheaper lands in Oklahoma, Colorado, Texas, western Kansas, and eastern New Mexico. In the process, producers and consumers of broomcorn have become widely separated, so that new marketing problems have constantly arisen which former marketing methods do not meet.

Extensive investigations by the Bureau of Agricultural Economics pointed to standardized descriptions for broomcorn and their application through a Federal inspection service as a solution to many of these marketing problems. Accordingly, United States standards for broomcorn were formulated and recently were put into effect. They offer advantages in the distribution of broomcorn not heretofore possible under the use of descriptive terms.

From a marketing standpoint, Federal inspection of broomcorn differs little from inspection of other farm products. The ultimate object is the same—to furnish all interested parties to the transaction a fair and impartial description of the broomcorn in question. This is accomplished, not by a casual inspection of the bale, but by drawing a representative sample which is carefully analyzed for every factor affecting quality and condition. The broomcorn-inspection certificate, signed by a Federal inspector, becomes a potent factor in consummating transactions. It provides a dependable description of the quality, length, hurl, dockage, and other factors which affect the value of the broomcorn, in terms which are so definite that, on these descriptions, buyers can adjust their buying closely to requirements. This marks an innovation in the broomcorn industry.

Marketing broomcorn on Federal inspection serves to stimulate confidence in trading, eliminates misunderstandings, and assures delivery of specified qualities on contract. It tends to eliminate the necessity of long, expensive trips to market to inspect purchases personally. Lower buying costs result, yet the buyer is assured of the delivery of the identical bales selected from the inspection certificates.

Seals for Identifying Bales

Buyers who store broomcorn recognize additional advantages in Federal inspection. Each bale is provided with an identification seal which insures the owner against loss, misplacement, or possible substitution of bales while in storage. Confidence is thus stimulated in accepting storage at shipping points, where interest or high freight rates can sometimes be saved. Inspected broomcorn, particularly when stored in a bonded warehouse, provides a good basis for borrowing money in order to carry the product until needed or for securing credit for buying large supplies when the time for such buying appears to be favorable.

Producers find Federal inspection of broomcorn advantageous. Standard descriptions are acceptable as a basis for financing the crop over periods of depression or market declines, thus promoting more orderly marketing methods. Federal inspection also serves as a basis for a comprehensive market news service whereby dependable information on broomcorn values can be secured and used more advantageously in the purchase and sale of broomcorn.

Dealers in broomcorn ultimately will recognize the advantages of Federal inspection. Marketing can be conducted on standardized description and without the responsibility of attempting to describe broomcorn in the vague indefinite terms now in common use. Thus trade expansion both in buying and selling will result directly in proportion to the extent that the terms of the inspection certificate becomes the common language for describing broomcorn.

G. B. Alguire.

BUDGETS Useful in Planning a System of Farming

A farm budget is a carefully worked-out estimate of how well a particular combination of crops or combination of crops and livestock will pay. This estimate is based upon the available information as to what the prices and crop and livestock production are likely to be during the year or

period of years just ahead. The budget should show in a simplest way the expected crop and livestock production, the expenses, and receipts for the particular system contemplated.

The purpose of working out farm budgets is to aid in finding the system of farming best adapted to the farm and to the conditions of the time. Usually a more profitable system will result if plans for the system, including probable expenses and receipts, are carefully worked out and compared with plans for other possible systems, before the system is actually put into operation. In this way costly errors may be avoided. Specifically, the use of farm budgets carefully worked out has the following advantages:

1. Budgets help farmers more accurately to appraise different systems and practices so that the most profitable systems and practices may be decided upon.
2. Budgets help to keep a balance between crops in a crop system of farming and a balance between crops and livestock in a crop and livestock system.
3. Budgets help to determine in advance how much seed, fertilizer, and other supplies are likely to be needed during the year.
4. Budgets help to determine how much feed will be needed for the livestock, how much will need to be bought and how much is likely to be available for sale.
5. Budgets help in determining the amount of cash that will be needed to operate the farm, and when this will be needed.
6. Budgets help in determining the total net returns that may be expected so that living expenses, payments, or investments may be adjusted accordingly.

Data Needed for a Budget

The returns actually obtained in farming probably will not approximate the returns contemplated in a budget unless the prices, requirements, and yields used in making the budget approximate those that actually prevail. Those used in making the budget should represent the best judgment of the one doing the planning as to the production and prices that may reasonably be expected for the particular farm and period, after considering all the information available. The information that will be useful is divided into two classes—that relating to prices and that relating to production.

The following are important sources of information on prices:

1. Outlook and intention-to-plant reports issued by the United States Department of Agriculture and outlook reports issued by the State colleges of agriculture.
2. The Agricultural Situation, a monthly publication issued by the United States Department of Agriculture and similar reports issued by the State colleges of agriculture.
3. Crops and Markets, and Foreign Crops and Markets, periodicals issued by the United States Department of Agriculture.
4. Bulletins and reports showing the results of special commodity price studies.
5. Market reports carried by the farm, State, and local papers.
6. Yearbooks of the United States Department of Agriculture and of State departments of agriculture.

The outlook reports and the Agricultural Situation carry conclusions as to probable price trends during the months just ahead.

Crops and Markets, Foreign Crops and Markets, and intentions-to-plant reports carry information such as is considered in arriving at the conclusions indicated in these reports. Bulletins based upon special price studies usually carry conclusions for a somewhat longer period. The other sources carry data that are useful in making an analysis of the price situation of the principal farm commodities.

Information on Production

Among the important sources of information on production are the following:

1. Records for the farm and similar records in the community.
2. Records showing county and State crop yields.
3. Books, bulletins, and reports showing the results of livestock feeding and crop experiments of the United States Department of Agriculture and State colleges of agriculture.
4. Demonstrations showing the results of practices in the community.

The publications which carry results of experiments are likely to be most useful in determining the yields that will probably result from the use of different fertilizers or other practices, and the livestock production that will probably result from different rations. One's own experience and records showing the results on other farms will be useful in localizing and interpreting the experimental data in terms of conditions on the farm and in determining the crop and livestock production that will probably result from the practices commonly followed in the community.

A careful study of production information will provide a basis for conclusions as to the crop yields that are most likely to be obtained, the quantities of the different kinds of feeds normally required to produce 100 pounds of pork or to put 100 pounds of gain on steers, or to keep a cow or a horse a year. A similar study of the information on prices will provide a basis for conclusions as to the prices that are most likely to prevail during the coming year and years just ahead.

Study the information and formulate judgments as to prices, crop yields, livestock production, and crop and livestock requirements for such crops and livestock as appear to have possibilities on the farm being considered. Next a budget for the present system is prepared; following this the farmer considers desirable combinations of crops and livestock for other systems and works out budgets for them.

Budgets Should Be Compared

The budgets worked out in this way should be compared. Each should be considered critically to determine how well the principal crops are adapted to the area, the effect of each system upon the fertility of the soil, the kinds of markets that are available for each of the marketable products, how nearly the feed crops provide a balanced ration for the livestock (if the system includes livestock), how well the crops and livestock fit together, and how well the nonmarketable products such as pasture, straw, stover, skim milk, etc., are utilized with each. With these facts and the returns that may reasonably be expected from each in mind one of the systems should be selected as the system to be followed.

J. B. Hutson.

BULLS Bred Pure Replace Scrubs in More Counties The Yearbook of Agriculture for 1926 announced the achievement of Union County, Ky., in banishing all grade and scrub bulls. It was the first county to reach that much-sought goal in livestock-improvement work. During 1927 two additional counties repeated the accomplishment. In October, Craig County, Va , disposed of its last grade bull, and approximately a month later Russell County, Ky., became the third county in the United States to banish all bulls except registered purebreds.

The results in each case were possible largely through the excellent cooperation of local breeders with county and State extension workers. In view of the wide interest in livestock improvement the following outline of the campaign in each county may enable leaders elsewhere to achieve similar success.

Bull Map Used with Success in Craig County

In Craig County, Va., W. O. Martin, the county agent, found by a preliminary survey in 1916 that every herd sire in use was a scrub of unknown lineage. Being convinced that improvement of this situation would add to the returns from cattle raising in the region, he set to work quietly on a better-sire program. He visited breeders, gave talks, wrote items for the local paper, distributed selected clippings and bulletins on livestock breeding, and otherwise sought to create a sentiment for a higher quality of stock that in turn would bring better prices. The cattle sold from the county all went the beef route, there being no serious attempt to develop purebred breeding herds. The persistent educational work continued for 10 years, at the end of which Mr. Martin took stock of the situation again. A survey in January, 1926, showed that the county contained 26 purebred bulls, of which 13 were Herefords, 10 Shorthorns, and 3 Aberdeen-Angus. There were also 18 scrub bulls still on hand.

As a record of the bull population he made a map (fig. 40) measuring about 3 by 4 feet, representing the county and containing the approximate likeness of every bull used for service. The various breeds were represented by pictures cut from breed papers. The scrubs were, of course, pictured also. This map hung conspicuously on the wall of his office. He also took it to meetings held in various parts of the county. Whenever a scrub bull was replaced by a purebred, he promptly pasted a likeness of the purebred animal over the scrub, leaving enough of the scrub showing to serve as a record of the replacement. Meanwhile he continued the incessant barrage of evidence showing the value of better breeding stock. This was so effective that the next survey, in January, 1927, showed 9 additional purebred bulls and 10 fewer scrubs and grades. Many of the breeders by this time were selling cattle sired by the newly introduced purebred bulls. Their satisfaction with both the class of stock and prices received helped the campaign considerably.

41 Bulls, All Purebred

L. I. Case, animal husbandman of the State extension service, made frequent trips to Craig County to aid in the replacement of inferior herd sires by carefully selected purebreds. Director of

Extension J. R Hutcheson also sponsored the work. It may be added that no special inducement, such as the lending of bulls, gifts or exchanges, occurred, but that every herd sire was purchased at a price in keeping with its value. The same condition was true of female stock, which also demonstrated the worth of good breeding. One stock owner who purchased a bred cow—a purebred Hereford—for $75 sold the calf for $100 and a second calf from the same cow for $90.

Meanwhile public sentiment and economic pressure were gradually having their influence on the owners of the few surviving grade bulls. A check-up on October 26, 1927, revealed that the county contained 41 purebred herd sires, all registered, and no scrub or grade bulls. This achievement was promptly recognized by the State animal husbandry and extension authorities at Blacksburg, Va , and

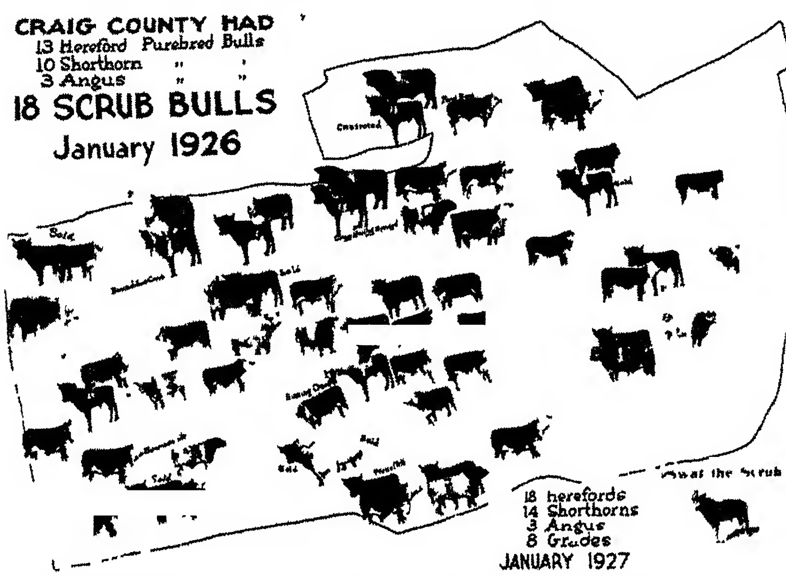

FIG 40—The bull map which was so effective in Craig County's successful better bull drive

by the United States Department of Agriculture. County Agent Martin reports that he has received requests for assistance in the selection of six more sires and that the number of bulls in the county probably will increase still more to meet prospective breeding requirements. Though the beef industry predominates in the county, the Guernsey breed of dairy stock is also represented and the combined efforts of all made it possible for Craig County to reach the 100 per cent purebred-bull goal.

Methods Used in Russell County

In Russell County, Ky., the drive against inferior sires was somewhat more intensive, being of only two years' duration. The accomplishment is especially worthy of attention because purebred bulls were very scarce in the region and transportation facilities meager. Most of the bulls introduced were brought considerable distances

and usually made the last part of their journey on foot. Russell County has no railroads nor hard-surfaced highways. The principal arteries of travel are the Cumberland River and dirt roads.

Although there had long been a recognition among cattle owners of the importance of good breeding stock, this belief did not take definite action until the recent campaign. The county agricultural agent, M. H. Sasser, was chiefly responsible for the final eradication of all bulls except registered purebreds. During the last part of the campaign three purebred bulls of good type were slaughtered merely because their registration papers could not be obtained.

The methods used in Russell County were of a "revival" nature. Mr. Sasser talked purebred sires on all occasions when he could find an audience. As described by Wayland Rhoads, Kentucky field agent in animal husbandry, Mr. Sasser "spoke to groups on the streets and in stores. He talked in the schools and at special meetings. He believed in the subject so deeply that his earnest talks brought larger and larger audiences." Literature was used to some extent but the spoken word proved to be the principal weapon used in routing inferior bulls from Russell County. At the close of the drive the county contained 51 bulls. About four-fifths of them were of the beef breeds, the others being dairy bulls.

D. S. BURCH.

CATTLE and Sheep in Big Herds More Liable to Foot Rot

When cattle or sheep are kept in large herds it is not uncommon for some of the animals to develop lameness accompanied by inflammation and degeneration of the tissues between the claws of the foot. The attack may be limited to one or two animals or it may spread until several members of the herd or flock are affected. The disease seems to spread most rapidly and with the greatest virulence where animals are kept closely confined in pens or in filthy barnyards. The course of the disease is slow as is also progress in recovery. Unless treatment is carefully and energetically applied, some of the animals may show evidence of sore feet for several months.

Although farm animals may become lame from a variety of causes, this discussion deals only with lameness caused by the contagious form of foot rot. The disease presents the same general characteristics when occurring in cattle or sheep, and is due to destruction of the tissues in the cleft of the foot following an invasion of the germ *Actinomyces necrophorus*.

How Infection Gains Entrance

These microorganisms gain entrance to the sensitive tissues of the foot by passing through some wound in the skin, such as a perforation resulting from stepping on a nail, sharp stick, or piece of wire. The germ, which is widely distributed in nature, will not penetrate the uninjured skin. Arriving beneath the skin, the bacteria lose no time in forcing their way into the healthy tissues where they soon cause the development of fever and inflammation.

The inflammation rapidly invades the sensitive tissues beneath the horn of the hoof, while from the ulcerous opening there exudes a thin, purulent fluid. Lameness has become quite evident at this stage,

and the region of the foot above the hoof may be swollen and warm to the touch, while the claws are frequently spread apart by the swelling of tissues between them.

If the condition is not treated in the early stages the infection may spread to the tissues beneath the horny covering of the foot, causing necrosis of the tissues and the formation of fistulous tracts. Should the loosened horn be cut away, it will be seen that the undermining process has been advanced by the microorganisms until numerous ulcerative channels have been formed which are filled with grayish, purulent matter and that the encroachment on the healthy areas is persistently and constantly being extended. Should but one of the claws be primarily affected, the disease may readily spread to the other by means of passages eroded beneath the skin. If the disease is neglected at this stage, deep abscesses may form and the pus may burrow deeper into the foot until the joint within the hoof becomes inflamed and its attachments destroyed. Should this condition arise, treatment will be very difficult and recovery greatly delayed. Whenever possible the services of a competent veterinarian should be obtained, especially if several animals are affected or if the disease is in an advanced stage.

Methods of Treatment and Prevention

In the earlier stages of the disease, thorough cleansing of the affected foot and an application of a carbolic-acid solution (1 ounce to a pint of water), clean stabling, and laxative feed will usually remedy the trouble. If the pus has burrowed deeply the carbolic-acid solution should be applied daily. After each of these treatments a pad of oakum or cotton smeared with pine tar fastened in the cleft of the foot with strips of soft cloth will assist in the healing process through its action in keeping irritants from entering the affected parts. Warm poulticing sometimes becomes of advantage in relieving excessive fever and pain.

When the pus has burrowed beneath the horny wall, the hoof should be pared away in order to obtain proper drainage and to allow the applied remedies to reach and destroy the infection present.

In treating a flock of sheep in which foot rot has become established, one of the first steps to be taken is to separate all that are in any degree diseased from the healthy portion of the flock. The sound animals should be passed slowly through a foot bath in which the disinfecting solution has a depth of at least 4 inches. For this purpose either a chloride of lime solution, consisting of 1 pound of chloride of lime to 12 quarts of water, or a carbolic acid solution, consisting of 1 pound of carbolic acid to 4 gallons of water, may be used.

Treatment in Early Stages

The treatment suggested for the sound portion of the flock will be suitable for use on animals in the early stages of the disease. Those more seriously affected should have each foot examined and all loosened horn cut away. If this work is thoroughly done, standing the sheep for 10 minutes in a strong solution of copper sulphate, made as warm as can be borne by the hand, will in most cases effect a cure. This solution may be prepared by dissolving 4 pounds of

copper sulphate in 5 gallons of warm water. This application may be repeated if necessary.

For treating a large number of sheep, a tight, wooden trough 20 inches wide, a foot in depth, and from 6 to 20 feet long, according to the number of animals to be treated, will be found most serviceable. Hurdles or portable racks may be so arranged at the sides of the trough and along the pathway leading to it, that each animal may be obliged to pass through the bath with but very little urging.

The animals whose feet have been treated should be removed at once to clean, dry, uncontaminated quarters.

Preventive measures consist in the cleaning and disinfecting of quarters where the affected animals have been previously stabled and avoiding, so far as possible, all infected premises or pastures.

H. J. Washburn.

CATTLE Feeders Can Save by Using U. S. Stocker-Feeder News The weekly stocker and feeder report which is released by the Division of Livestock, Meats, and Wool at some of the principal livestock markets, such as Chicago, Kansas City, and South St. Paul, was instituted mainly to better serve prospective purchasers of animals in stocker and feeder flesh. Its purpose is to give as complete and concise a summary of current market conditions on such stock as possible. The importance of a special report covering stocker and feeder cattle can readily be seen when it is found that frequently as many as 50 per cent of the cattle coming to some of the large markets arrive in thin or half-finished flesh condition.

It was the custom among many cattlemen in former years to keep steers destined for slaughter from three to four and sometimes five years before marketing, and in that case fewer cows were maintained. During recent years the tendency has been to keep a greater percentage of cows, making it possible to produce and market a greater number of lightweight beef animals each year. The proportion of stock calves and yearlings marketed is much greater than formerly, and the number of cattle which are purchased at stockyard points and taken back to the country for grazing and for further finishing has greatly increased. It is primarily for the purchasers or finishers of such cattle that the weekly stocker and feeder reports are published.

These reports contain market comment concerning feeder and stocker cattle, pigs, and sheep and lambs which is concise and specific in nature. Reference is made to the number and sources of supply, weight descriptions, and prevailing prices, giving the prospective purchaser useful information as to the number, kind, and character of stocker and feeder animals which he may expect to find on a particular market. In the case of steers, heifers, cows, and calves, these are commented upon separately and reference is made to outstanding sales as well as to the price level prevailing for the general run of stock. Statistical tables are presented showing the number of head sold on country account, average weights and prices, as well as price ranges for each class, with comparisons with those of the previous week and a year ago, this information all being based on actual transactions. Another table shows the State destinations of steers, by different weight groups, and also the State destinations of heifers, cows, and calves.

Practically Useful to Buyers

With a little study and experience combined with some knowledge of the quality and character of supplies available at different markets, prospective purchasers can and do use this report to very good advantage. A purchaser obtains a clear idea of the supply available and the general trend of the market and the volume of trade. By following these reports closely, purchasers are frequently able to tell whether there is much chance for a break or rise in market values in the near future. Usually the feeder or buyer has his mind made up as to the weight of the animals which he wants to feed and by a study of the statistical tables he can see the price spread on each of the various weight groups as well as the weighted average price per hundred pounds of each group or class. In the aggregate, as an additional aid to the prospective purchaser, it is often possible to learn from these reports released from the different markets, what weight cattle or other stock should be in best demand on the market in the near future and consequently what weights should prove the most profitable for him to feed. Therefore, the reports very often serve as an accurate barometer of when to buy, what to buy, and about when to come back to market.

E. C. ECKLOFF.

CATTLE Grading at Demonstrations Is Help to Producers An extensive program of cattle-grading demonstrations has been held during the past four years on farms and ranches in various parts of the United States. The work has been sponsored cooperatively by the Bureau of Agricultural Economics, the Washington Office of Extension, the States Extension Service, and the county agents in 16 States. Nearly 400 demonstrations have been conducted, attended by 22,000 to 25,000 people representing ownership estimated at 750,000 head of breeding stock.

These demonstrations aim to acquaint producers in a graphic way, on the producer's own farm or ranch, with the variations in conformation, finish, and quality which determine the grade of certain types of cattle and cause them to be sorted and sold in different lots—which, in many instances, almost amount to different commodities—upon their arrival at the large central markets. With a constantly increased stressing of quality by meat consumers, which in turn has caused a large part of the need for selective segregation of cattle, values have largely become established on a grade basis.

These demonstrations have been made at conveniently located ranches where neighboring ranchmen could assemble and observe the actual market grading of a mixed run of cattle. (Fig. 41.) Herds were sorted into their different market grades and classes just as they would be handled in central market trading. Explanations were given of the differences in conformation, finish, and quality that place different animals in different grades. The difference in comparative values, not only in market price but in feeding quality, are pointed out.

This separation of bulk commodities into grades has become noteworthy in all agricultural and manufactured products and has developed so rapidly during the last 12 or 15 years that producers frequently did not sense the changes taking place at the markets which required

drastic changes in production methods, if profits from husbandry efforts were to be maintained.

The Division of Livestock, Meats, and Wool of the Bureau of Agricultural Economics, through its market news service at the larger stockyards and in the big eastern cities, studied and analyzed this trend of developments until it was able to set up either tentative or official grade standards for nearly all kinds of livestock and their related meats.

Cattle, whether stockers, feeders, or slaughtei animals, were found to show the greatest variation of any kind o' livestock because of tho wide differences in their degrees of conformation, finish, and quality. This is also true of prices both with respect to the extreme range between the poorest and best grades of cattle, and in the range of prices paid by consumers for the different cuts of meat from the same carcass.

FIG. 41 —Grading demonstration on a Colorado ranch

Market Unit Large

Cattle occur in larger production and market units than any other kind of meat animals or than any other agricultural commodity. Other lines, for instance, sell unit bales of 500 pounds of cotton, of 500-pound bags of wool, or of 250 to 300 pound hogs, but the unit of cattle averages around 950 pounds. The past three years a total of approximately 24,000,000 head of cattle, including calves, has entered American domestic consumption annually and every State, doubtless every county, has supplied a part of that total.

Such widely distributed sources of supply have constituted the principal reason for the lack of uniformity in quality Beginning with the strictly dairy breeds, mostly low-quality meat producers, we find every possible kind of results from cross breeding and the use of scrub-breeding stock, until the choicest products of the strictly

beef breeds are reached. When shipped to central markets all of these are sorted into certain fixed grades for trading purposes. They lose all breed, State or geographic identity, but fill certain trade requirements, and sell for widely different prices because of variations in supply by grade, compared with variations in demand by grade which are independent of variations in total receipts of cattle on the current market.

To take this knowledge of market grades, and of the facts behind the making of market prices, back to the livestock producers is the specific reason for holding cattle-grading demonstrations in the producing areas. As a result stockmen could see in their herds the variations which would place some cattle in one grade and others in other grades. They could also learn to grade, in a community way, for cooperative shipment; could assemble and grade for direct market shipment or auction sales and could classify and grade their central-market shipments so they would sell to better advantage and relieve the commission man of the time and worry of sorting a mixed lot of stock during the rush of market hours. In other words, by grading at home they could meet one of the outstanding requirements of marketing, thus performing a service for which previously some other agency had been well paid.

The aid given to the producer in reading market reports intelligently will help them to recognize in their herds the grades they are producing. In this way comparison of prices in one market with another can be made, and shipments can be sent to the best one for the grade of stock shipped.

Culling a Part of Grading

As culling is a part of grading the demonstrations aid in advancing general animal husbandry. As a result of culling the average quality of the breeding herd and of its product has been raised and production has swung into the habit of meeting definite market requirements.

Total results have been widespread for good in the sections where cattle grading has been done. They have aided the reestablishment of the cattle industry on a profitable foundation after the postwar depression and liquidation. Markets have shown that profits now depend largely on the quality and grade of the cattle. Demonstrations have shown how these market requirements can best be met.

James K. Wallace.

CATTLE of Longhorn Type Saved from Threat of Extinction

The first cattle to set foot on North America's shores were landed near Vera Cruz, Mexico, in 1521, from some ships under the command of Gregorio Villalobos, a governor general sent to rule New Spain. These Spanish calves were the progenitors of the millions of longhorn cattle that spread rapidly fanwise from Vera Cruz, over the coastal plains of Texas and the Great Plains region of the far West. In forage and climatic conditions these cattle found themselves in a region very like that they had left in Spain, and they thrived from the first.

Texas at the close of the Civil War was overflowing with longhorn cattle. With the end of hostilities this overflow surged northward

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across the plains until from the Gulf to Canada this hardy breed had pressed the buffalo and the Indian back and made the whole country theirs. But the longhorns were "too much legs, horns, and speed, and not enough beef," and they in turn had to give way. Within comparatively few years this breed of cattle, so closely tied up to the history, romance, and adventure of the Southwest, was about to become extinct. To some men who had known the longhorns for nearly half a century this seemed almost a tragedy—a national misfortune. For years, however, appeals to Congress for money to buy a few from those still left fell on deaf ears. But last year a small sum was granted for the purchase of a few cows and some bulls, and two very much pleased forest officers went down into Texas in search of longhorns.

At Fort Worth, San Antonio, and other points the general feeling was that their quest would be unsuccessful. "A few old cows might be found," they were told, "away down in the 'prickly pear' country of the lower Rio Grande, in the dry *resacas*, or the cottonwood *bosques* along the river, or in the dense mesquite thickets of the plains." But bulls! Well, that was something else again. Everybody doubted the possibility of finding them.

Beginning of the Search

John H. Hatton, from the Denver office of the Forest Service, and the writer first plunged into the prickly pear country between Laredo and Brownsville on the Rio Grande and Corpus Christi on the Gulf. Every nook and corner of this region was hunted out, using every imaginable kind of transportation. It was necessary to invent a standard type by which to make selections. The searchers talked longhorns to every human with whom they came in contact. From all this and from their experiences in the past they built up in their minds a picture of the old-time longhorns from which they developed a standard or type.

In two weeks they had spotted 10 cows and 1 bull in that corner of Texas as meeting their requirements, picking up one here, one there. They hired a cattleman who knew the country to gather them at a central point of shipping; and having exhausted this end of Texas they moved up into the great coastal plains region between Houston and Beaumont. Here was an entirely different country—vast open prairies with some piney woods and scattering mesquite, 10,000 acres in a single rice field, 150,000 acres in one cow pasture—one of the great range-cattle sections of the State. The region was combed thoroughly, and 10 excellent longhorn cows and 2 good bulls were gathered.

Inasmuch as the steers are the ones that develop the extremely long horns, three glorious animals with good-sized horns were brought to be kept as an exhibit of what a longhorn should be. They are all young and their horns will probably grow at least 18 inches more in the next three or four years. They will fill out the picture until some can be raised.

Cattle Gathered at Fort Worth

The two shipments were concentrated at Fort Worth, and dipped three times at seven-day intervals to free them of the deadly Texas

fever tick, and tested for tuberculosis. Then the whole bunch were put through a branding chute and branded "U. S." on the left hip.

The longhorns were shipped from Fort Worth to the Wichita National Forest. It was like old times to sit in the caboose of a long freight train with a car of cattle ahead, and crawl "over the top" of the train in the dark night to make sure the cows were all there. Cache and the Wichita Forest were eventually reached and the cattle placed in the pasture provided for them. Swarms of people came out from surrounding cities to look them over and the old-time cow men of the region all agreed that the bunch which had been collected were really fine specimens of the old longhorns—perfect types with which to build up a modest herd of 250 or 300 head and thus preserve the breed for future generations of Americans to study and admire.

Like the buffalo, the longhorn will not become extinct.

WILL C. BARNES.

CATTLE Price Trend Strongly Affected by Value of Dollar Price to the cattleman represents more than just the exchange value of his commodity in terms of dollars and cents. It includes variations in the value or purchasing power of the dollar. In other words, price represents not only an equilibrium between the supply and demand forces in the market but also changes in the general price level for all commodities. With these forces and the general price level constantly changing, cattle prices fluctuate from day to day, month to month, and over long periods of time.

Studies made by the Bureau of Agricultural Economics show that the important factors affecting yearly prices of good cattle on the Chicago market in the order of their apparent relative significance are the general price level of all commodities, cattle supply, price of corn, hog prices, demand for feeding cattle, export demand, and growth in population.

The general price level for all commodities is the most significant factor causing long-time changes in cattle prices. The upward trend in cattle prices prior to the World War, and the high prices during the war, were largely the result of the declining value of the dollar, or in other words, a rising price level for all commodities. Because cattle prices in general advance or decline with the changes in the general price level, the true relationship between cattle prices and other important factors, such as the market supply of cattle, is greatly obscured and makes it difficult to appreciate the true position of the industry.

Effect of Supply and Demand

Figure 42 shows actual cattle prices at Chicago and the same prices adjusted for changes in the value of the dollar together with cattle receipts at that market. It is apparent from this chart that in most years there was a close inverse relationship between the adjusted price and the market supply of cattle. Some of the variation in supply was not always accompanied by corresponding inverse changes in the adjusted price. This was especially true in 1902, 1918, and 1921, thus indicating that other factors were in part responsible for some of the price variations.

When correlating simultaneously various supply and demand factors with adjusted or "deflated" prices of good grade steers at Chi-

cago it was found that supply was the most important factor causing variations in cattle prices. The second factor in importance was the price of corn. This proved to be an indirect forecasting measure of the quality, weight, and proportion of fed cattle. The influence of this factor was particularly noticeable following the small corn crops of 1901, 1911, and 1924. These small crops resulted in high corn prices, causing short supplies of fat cattle, especially long-fed steers, the following year. The reverse situation was true in 1926 when there were large supplies of finished steers following the big corn crop of 1925.

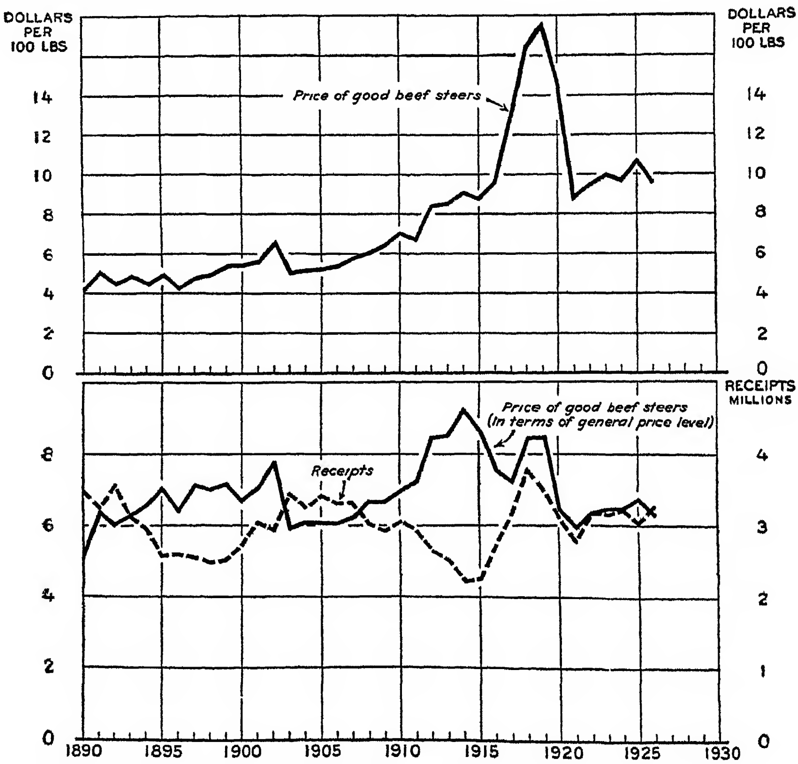

FIG. 42.—RELATION BETWEEN PRICE AND SUPPLY OF CATTLE AT CHICAGO

Actual cattle prices show no apparent relationship with the supply of cattle, but after removing the effect of general price level there is a close inverse relationship

Next in importance was the current demand for feeding cattle. When a large proportion of total cattle receipts were purchased as feeders, competition between feeder buyers and slaughterers caused fat cattle prices to be higher than normally expected from other conditions.

Interchange of Beef and Pork

The interchange of pork and beef by consumers was apparent by the close correlation between cattle and hog prices, indicating that the demand for slaughter cattle was influenced somewhat by hog prices.

Export demand for American beef at one time was an important factor affecting cattle prices. Exports were large prior to 1908 and

during the period of the World War, but in recent years have been negligible.

In studying cattle statistics one is impressed with the up-and-down swings in production and prices. These periodic changes are generally accepted phenomena but their existence is often overlooked as is the likelihood of repetition. The cyclical swings in production are most readily observed in market supplies. The corresponding price swings have been almost entirely obscured by changes in the general price level. The time between periods of small supplies, or from peak to peak of the corresponding price cycle, has averaged about 16 years.

Wartime Market for Beef

Following the low point in market supplies between 1912 and 1916, high prices and war demands for beef greatly stimulated cattle production. The large market supplies from 1922 to 1926, the deferred peak of a production cycle, were the result of the high level of production attained during the war plus accumulations during the post-war adjustment in prices and the marked tendency to reduce herds because of relatively low prices.

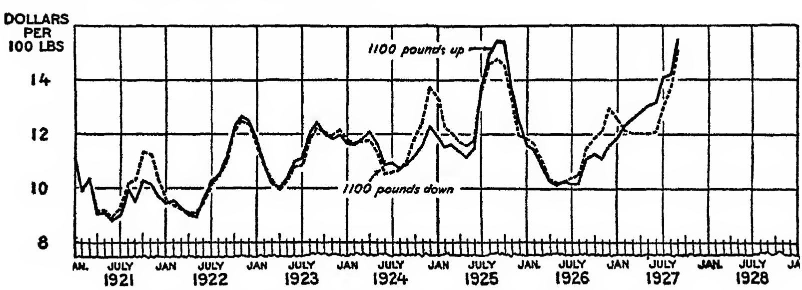

FIG. 43.—PRICES FOR CHOICE BEEF STEERS AT CHICAGO

In recent years the price premium for the different weight steers has been rather wide, with a rapid shifting from one group to the other

The increasing tendency during the past 20 years to market cattle at younger ages and lighter weights has tended to revolutionize production methods and to reverse ideas as to market values. The producer has found that a more rapid turnover in production is desirable from the standpoint of efficiency and economy. This fits into the general scheme of intensified farming in the Corn Belt and a more efficient use of the range. The consumer prefers smaller, more tender, and less wasty cuts of meat. The business of retailing of meats has become more of a science in recent years and the tendency among retailers is to select carcasses that will cut out to their advantage.

Prices of Different Weight Groups

Over a long period of time there is a close adjustment between price and supply of comparable heavy and light weight cattle. It is not necessary to go back more than 15 years, however, to find top prices of 1,350 to 1,500-pound steers always above top prices of 700 to 1,150-pound steers, whereas during recent years there has been an alternating tendency for first one weight group to be at the top and then the other. Recent comparisons of average prices are shown in Figure 43.

The system of producing heavy fat steers, especially extreme weights, has become considerably more hazardous than in the past.

H. M. CONWAY.

CATTLE Range Man Comes Through Slump Period With Profit During the unfortunate years of financial troubles coupled with critical drought conditions between 1919 and 1925, stockmen all over the Southwest and more especially the cattlemen suffered serious financial losses. Cattle prices were low, range losses due to prolonged drought were heavy, calf crops were considerably below normal, and the demand for surplus cattle extremely light. In spite of these facts some range-cattle raisers showed a fairly good interest return on their investment when their books were balanced at the end of the period. This was because they had used improved and businesslike methods in handling their range and stock.

A typical instance of this kind was that of T. G. Cavness, a permittee on the Prescott National Forest in central Arizona. In the summer of 1916 he purchased a ranch in that forest carrying about 600 head of cattle of all ages, together with the necessary horses, camp equipment, etc., for handling the herd on the open unfenced range. Cavness's range was no better than the general run of the ranges used by himself and his neighbors in common. Expenses were heavy and he decided that a fence around his range would pay big dividends. Under an agreement between himself and the Forest Service his entire range was surrounded with a good four-wire fence.

Handling of Herd Facilitated

His fence completed, he cleared all stray stock out of the inclosure and found he could handle his herd with much less labor and also without the injury which cattle always receive on an open range from excessive driving, crowding, and handling. He sold all the old bulls and bought bulls of the best range breeds, placing on the range six bulls to every hundred breeding cows. With more bulls and his cattle under close control his calf crop immediately jumped from about 50 per cent, the normal increase throughout that region, to about 80 per cent.

The calves were branded when they were old enough to be dehorned, branded, and marked at one time. Instead of branding by the old range method of roping each calf, dragging it to a fire and bulldogging it, he placed the herd in the corral, had the calves dodged out into a small pen, and put them through a small chute in which they were held securely by mechanical means while being branded. It was not necessary to round up the herd more than once or twice during the season so that an immense amount of handling was eliminated.

Cavness sells his older cows each year, replacing them with heifers of his own raising, and also sells all male animals, so that at no time does his herd number more than 600 head. His experience has shown that his pastures will carry that number and always provide ample feed. His yearling heifers are kept by themselves and are not allowed to breed until after 2 years of age.

Steers Bring Premium

As a result of the improved methods of management and the good bulls used, the Cavness steers invariably weigh far more than the steers from adjoining ranges, and buyers have willingly paid Cavness as high as $5 a head more for them. Inclosing his range with fences enabled him to do away with a large number of saddle horses as well as to reduce the number of men necessary to handle the herd, and thus to cut down expenses materially. As he believes in heavy salting he furnishes his cattle with all the salt they will eat.

Taking the period from 1919 to 1926, inclusive, Cavness's books show an annual income from his investment amounting to a little more than 6 per cent. His expenses included a personal salary of $100 per month and all household expenses for himself and family.

Cavness uses modern methods whenever they make for economy. For instance, he sold a number of yearling heifers, contracting to deliver them to an alfalfa farmer in the Salt River Valley near Phoenix, Ariz. From his range to the farm was about 75 miles over a rough desert country with very high daily temperatures. To make the drive on foot would have taken from three to four days and would have necessitated hauling hay out along the trail for feed at the end of each day's drive. It would also have involved a heavy loss in flesh, and as the animals were to be sold by the pound, every ounce they lost in weight meant a direct loss in value.

Cattle Hauled by Auto Truck

Cavness, therefore, decided to have them hauled by auto truck, a startling innovation in the handling of range cattle. He arranged for a number of trucks provided with crates into which the animals could be loaded. The trucks reached the ranch in the evening, the animals were loaded with very little delay, and long before daylight the next morning they were unloaded at the farm and were grazing comfortably in the alfalfa, the shrinkage amounting to practically nothing. The animals sold at 5 cents a pound, which amounted to an average of $25.35 a head. The cost of trucking was $2 per head. This made the yearly heifers net $23.35, which was considerably above the average price in the neighborhood for that year, 1923.

Cavness's management of his herd is no secret; there is no patent on his plans. His methods are those which any of his neighbors can copy if they so desire. Very much the same results have been obtained by other permittees on the national forests in the Southwest during the same period where like practices have been followed. On the Santa Rita Range Reserve near Tucson, the books of the three permittees using the range, which is fenced and cross-fenced, show a net profit on several years' operations of more than 7 per cent on the capital invested.

WILL C. BARNES.

CENTIPEDE Grass an Excellent Pasture in Southern States Seed of centipede grass (*Eremochloa ophiuroides*) was received from China through the Office of Foreign Plant Introduction in both 1918 and 1919. Since it came from the Province of Hunan, China, it was first called Hunan grass, but was afterward renamed centipede grass because

this was reported to be the name applied to it by English residents of Foochow, China, where it is the principal lawn grass. The name centipede grass is very appropriate, because the long creeping stems or stolons with their numerous root connections in the soil somewhat resemble a centipede. It is probable, therefore, that this name will continue to be used for it in the United States.

J. B. Norton, one of the agricultural explorers who collected seed of it in China, has this to say of its importance there:

> The best lawn and grazing grass of this region Throughout the clay region and the gravelly sand alluvium this is the dominant grass. All the neglected fields and washed hillsides are overgrown with it. It is valued highly in Kuliang and in Foochow as a grass for lawns, and is the best grazing grass in this region, growing with *Lespedeza striata* and allied forms over the fallow terrace lands. The prime condition of the cattle grazing on these hills depends on the prevalence of this grass and lespedeza. This is also an excellent plant to prevent washing; the long runners stretch out in every direction, root at every node, and soon branch and make cover. If it can be grown even as far north as North Carolina, it will solve the lawn difficulties of the Eastern States, where none of our grasses are satisfactory the year round

Famed for Lawns and Pastures

From the foregoing quotation it may be seen that centipede grass has an excellent reputation in southern China as a lawn and pasture grass. It is not hardy enough for our Northern States and may be expected to behave as a perennial only south of a line from Wilmington, N. C., to Shreveport, La. Since centipede grass is propagated vegetatively, it is of no value in any locality where it will not live over winter, and attempts to grow it should therefore be confined to the Gulf States or the same latitudes farther west.

The United States Department of Agriculture has grown this grass in an experimental way for the last seven years at Tifton, Ga., Gainesville, Fla., and McNeill, Miss. In its early growth the grass is protected from destruction by grazing animals through the closeness with which the runners and leaf blades adhere to the soil. This enables it to become established in pastures even while the land is being grazed over. (Fig. 44.) After it becomes thick on the ground, the leaf blades grow more or less vertically to a height of 3 or 4 inches. In this condition it makes an excellent pasture and remains green when other grasses dry up. On a rather barren, rocky hillside pasture at McNeill, Miss., it remained alive during the extremely dry summers of 1924 and 1925 and in 1926 was spreading rapidly among the native grasses surrounding it. Carpet grass is, no doubt, preferable to centipede grass on moist, sandy soils in the Gulf States, and Bermuda grass will continue to supply the bulk of the pasturage on the better clay or silt soils in many localities; but centipede grass can be be used to advantage on the drier and poorer soils. In all pastures lespedeza, white clover, black medic, and other legumes should be grown in mixture with these grasses, and Dallis grass, Vasey grass, and Bahia grass are valuable in some situations.

Centipede Grass Propagated Vegetatively

Centipede grass is propagated vegetatively in much the same way as Bermuda grass. Material for planting is hard to obtain in quantity as yet, although two firms in Florida have planted several acres of it and are prepared to deliver propagating material in commercial

quantities. On golf courses and lawns, where water is available, the same methods followed in establishing creeping bent will give good results with centipede grass. In pastures the best method is to plow shallow furrows in the native sod at intervals of 4 to 6 feet and in these furrows set small pieces of centipede grass sod every 4 feet. These pieces of sod should not be covered completely, and the soft earth must be tramped about them firmly to keep them from drying out. If the season is favorable the grass will soon take root and begin sending out stolons which in two years will occupy most of the space between the furrows. The cost of setting a piece of land to centipede

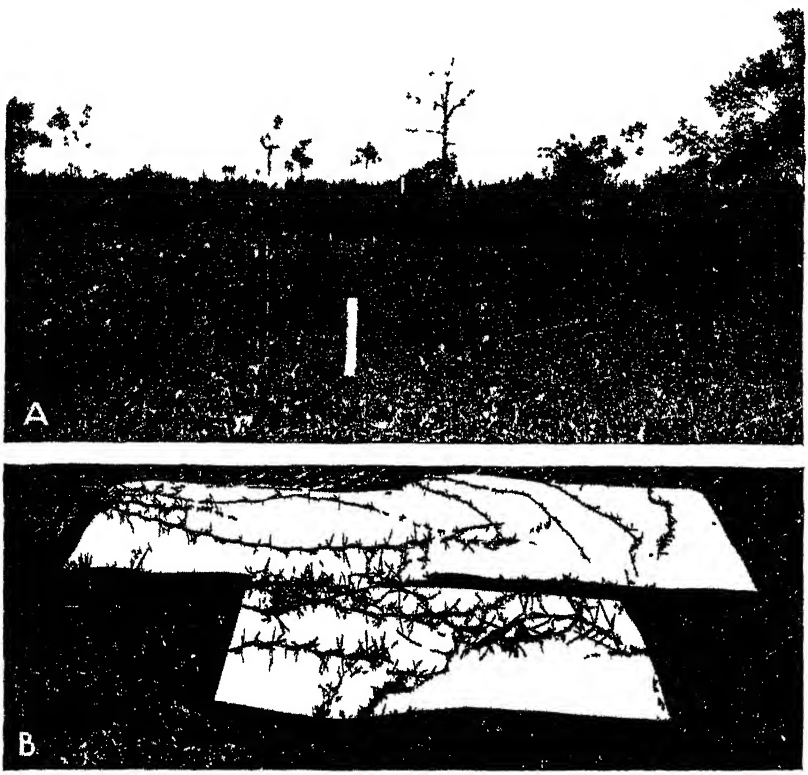

FIG 44—Centipede grass at the Coastal Plain Experiment Station, McNeill, Miss: A, A pasture in which centipede grass has almost completely displaced the native grasses on a poor stony hillside. The pasture has been in constant use since the grass was planted, B, A close-up view in the same pasture with white paper under the stolons or trailing stems to show in detail how the grass spreads

grass in this way is not excessive. One man with a plow and two following with buckets of the sod will cover a good many acres in one day. Broadcasting the chopped stolons on plowed land and covering with a disk has been rather unsuccessful, because the small pieces of stolons either are covered too deeply or dry out before they have time to take root.

Attempts have been made to find a supply of seed in China, but with very little success. In 1923, in reply to a request for more seed of centipede grass, H. C. Graybill, of the Canton Christian College, Canton, China, wrote: "I am sorry to say that I have never been

able to collect seed from the Eremochloa grass. Most of the heads contain no seed whatever. One has to search to find even half a dozen seeds." If good seed were available, centipede grass would be much more popular. In the United States it shows the same tendency to produce scanty seed crops as it has in China. W. E. Stokes, of the Florida Agricultural Experiment Station, made counts of the seed produced at Gainesville, and found an average of only 4.64 seeds to the panicle or seed head. H. R. Reed, McNeill, Miss., in an examination of seed heads found an average of 12 seeds per head. This is much better than at Gainesville, Fla. It is possible that seed may be successfully produced under irrigation in Arizona or southern California. The seed gathered at Gainesville and McNeill germinated 50 to 65 per cent, which is satisfactory if equally good seed could be harvested by machinery.

While centipede grass withstood a temperature of 12° F. at the Georgia Coastal Plain Experiment Station, Tifton, Ga., in January, 1924, it is well to remember that this grass is not adapted to conditions in the Northern States and will not succeed there.

H. N. VINALL.

CHEMISTS Explore Ways to Utilize By-products Now Called Farm Wastes

The utilization of farm wastes, or what perhaps may be more appropriately designated farm by-products, presents problems of scientific interest to chemical technologists, and problems of financial interest to the farmer, to the manufacturer, and to the consumer. It is not enough that chemical research discover useful products to be obtained from these materials and suitable methods for their manufacture. Economics and engineering also must make their contributions. Farm by-products must enter competitive markets, not the finished product only but also the raw materials. It is the province of economics to study these markets and to report on the conditions found. Engineering should also make a valuable contribution. A factor of leading importance in the profitable utilization of farm products, when a potential use has been found, is their collection and transportation to manufacturing centers in such a way that they will compete successfully with similar raw materials, at a price which will permit a substantial return to the farmer, the original producer.

For instance, for every 100 pounds of grain produced there is at the same time produced as a by-product from 100 to 250 pounds of straw or stalks and husks. But the energy of the farmer and the fertility of the soil are expended in producing the by-product as well as the grain; therefore a better and more profitable utilization of such by-products is a conservation of our natural resources. Indeed, from a purely economic standpoint it is of greater importance to conserve material already produced than to produce additional material. In a limited way, farm wastes find a market at present, but under such conditions that the larger share of the return goes to collecting and transportation agencies, and but a small part reverts to the farmer.

First Emphasis on Laboratory Work

Up to the present by far the greatest emphasis has been laid on the first of these three factors, the production in the laboratory of

new and useful materials from farm by-products. The Bureau of Chemistry and Soils, the Forest Service, the Bureau of Animal Industry, and the Bureau of Plant Industry have pioneered in investigations and basic researches which have resulted in finding many promising uses for farm wastes. An instance of what may be done by the chemist is the production of furfural from corncobs, oat hulls, peanut shells, and similar wastes. Furfural is a liquid obtained from the acid or pressure distillation of pentosans, substances which are present in varying quantities in agricultural wastes, especially in corncobs, oat hulls, cottonseed hulls, bran, straw, and other cellular materials. When one of these materials is heated with water and acid, or with water alone, under pressure, the pentosans are decomposed into furfural which distills and may be recovered by concentration from the distillate.

When work on this problem was started in the Bureau of Chemistry and Soils, about eight years ago, furfural was a chemical curiosity, selling for $30 a pound. After an investigation which lasted several years, a process for the economical production of this material was worked out, and special apparatus was designed for the purpose. The project was then taken up industrially, and a rapidly growing business was founded, in which furfural is now produced at the rate of more than half a million pounds a year. It now sells at from 10 to 17½ cents a pound, the price depending on the quantity purchased. Furfural is employed in the manufacture of synthetic resins, solvents, and insecticides, and new uses are constantly developed. Thus a new industry was started in North America, the possibilities of which we can not now fully comprehend but which had its origin in basic research initiated in the department on the lowly corncob.

What the Corncob May Yield

It is not an unreasonably wild speculation, at least to the romancing chemist, to imagine a time when we may ride home from work in a car fitted with electrical equipment made from corncob plastic, painted with corncob lacquers, enter a home built with corncob board and covered with corncob shingles, exchange our work coat for an easy jacket made of corncob textiles and colored with corncob dyes, seek an easy chair made of corncob products, read the evening gossip from a paper made of corncob pulp and printed with corncob ink, toast our toes before an open fire of corncob briquettes, and sooth the senses by smoking a corncob pipe.

In 1921 the Bureau of Chemistry undertook a study of the production of gas from straw and similar material in many instances now being wasted on American farms. Experimental equipment was installed in the laboratory and was successfully operated to produce illuminating and motor-fuel gas from straw. Both tar and carbon were produced as refuse. Since that time a plant on an industrial scale has been started in Minnesota. It is now under operation and is growing. In this plant the straw is fed into a cast-iron retort and heated; the gas and tar are drawn off, and the carbon is discharged. The process is continuous. In experimental work by this company wheat, barley, oat, and rice straw have been used. Three classes of products are manufactured: Paint and auto top dressing, the carbon being used as a base; roofing materials from the carbon and the tar pitch; and disinfectants from the lighter parts of the tar. Part of

the gas is employed in heating the retort after the operation starts; the rest is wasted at present, but could be supplied to other industries for heating and lighting if they were near at hand.

The Department's Primary Interest

The interest of the Department of Agriculture is primarily in the pioneering stages of these projects, that is, in demonstrating the technical possibilities, but it does not end with the completion of the actual experimental work. The different bureaus of the department stand ready at all times to assist with advice in the testing of products, in suggesting markets, and in the improvement of processes, wherever this service can be offered without trespassing too far on the field of private endeavor. The translation of the laboratory results into profitable development must, of course, be left to industry.

Other investigations of a somewhat similar nature have dealt with the utilization not only of farm wastes, properly so called, but also with the uncultivated products found in large quantities in many parts of the country. Prominent among these are different forms of tannin-bearing materials. The native sumac has been studied, and a report has been issued showing the tannin content of various species of this plant, the best time to gather it for the maximum yield of tannin, and methods for curing the leaf. Attention has been given to the industrial utilization of other minor and low-value farm and forest products, such as the palmetto, nut shells, hardwood leaves, woods, barks, galls, roots, pods, and miscellaneous plants, to augment our tannin supply, which is fast diminishing as a result of the ravages of the chestnut blight. This is a matter of grave public concern, for as the tannin supply diminishes the price of leather increases, which means an advance in the cost of shoes, with no increase in the price paid the farmer for hides.

Paper from Cellulose Products

One subject which has received particular study from several branches of the Department of Agriculture is the paper-making value of cellulose products of many kinds. Straws of all varieties, cornstalks, bagasse, waste woods, marsh grasses, hop vines, cotton stalks, and many other minor products have been studied under various conditions. Their utility for making paper and board on a laboratory scale has been investigated, and the chemical technology of the processes has been fairly well developed.

The Bureau of Chemistry and Soils has undertaken various other projects, some of which are still under way. They are too numerous for more than a mere outline of each, but they all have for their ultimate aim a benefit to American agriculture. Among these may be mentioned the utilization of culls in the citrus industry, the manufacture of sweet-potato sirup and sweet-potato starch from oversize potatoes, and the utilization of by-product sirup of the sugar mill. A study of the constitution and possible uses for lignin, which is combined with cellulose in the woody part of all plants, merits special mention. Millions of pounds of lignin are discarded by the paper-pulp industry annually; lignin is probably our greatest agricultural waste. In the course of research on this problem, it has been found that lignin will combine with various dye intermediates to form a series of brown

and yellow dyes, and that lignin from corncobs may be dissolved in a special solvent to make a varnish. A series of these dyes recently produced in the department laboratories are of handsome shades, perfectly fast, and are far better products than those resulting from the first attempts at producing dyes from coal tar 50 years ago. In lignin we have a raw material of wonderful possibilities, which forms about 30 per cent of all vegetable dry matter. Another interesting observation is that when lignin is distilled, about 4 per cent of eugenol, the active principle of oil of cloves, is produced. This fact may have some industrial importance.

Another investigation now under way merits consideration. It has a bearing on the future utilization not only of farm wastes but of the major products themselves. Much, if not all, of the chemistry of vegetable life is performed in the cell by means of enzymes and the reaction of sun and air with the elements of the soil. Thus we have the coloring matter, the alkaloid, or the foodstuff, all equally built up from a few elements taken from the air and the soil. When the task of duplicating these substances has been given to the chemist, he has generally had to call on the ponderous forces at his command, he has constructed acres of buildings, filled with tons of machinery and operated by hundreds of men, to do the work accomplished noiselessly and efficiently in the slender stem of the plant. In certain cases, notably in alcohol production, the chemist has specifically directed the forces of vegetable life, and has evolved many useful substances through the agency of some of the simpler forms of plant life.

Action of Molds, Yeasts, Etc.

It is believed that reaction of this type may be utilized further and that the action of molds, yeasts, and bacteria may be harnessed in diverse ways to develop a chemistry simpler than our present highly complex procedure. In applying this idea, the chemist has taken dextrose made from cornstarch (an increase in the utilization of which will be of special benefit to the corn farmer), and has tested the action on it of a number of different molds. One of these organisms has been discovered which gives gluconic acid, previously one of the rarer chemicals, in good yields and at a reasonable price. It is believed that uses for gluconic acid will be found, which should lead to its production in large quantities, with consequent advantages to the grower of the corn from which the dextrose is produced. Similar lines of investigation are planned, in the hope that the farmer's output, whether it be product or by-product, may find additional markets in ways hitherto untried, and with greater profit.

The collective consideration of all the foregoing brings us to the second aspect of this question, the economic one. Consider the making of paper. The department has developed methods for handling the various raw materials suitable for this purpose and has shown that technically it is possible to produce crude or refined cellulose, paper, or boards from them, but that under the competitive conditions existing with the materials long used in paper making, it has not up to the present appeared feasible or profitable to make high-grade paper in this way. It should be borne in mind, however, in the study of farm wastes, that the exhaustion of the supply of previously used materials, their increasing cost, their tremendously

developing consumption, and the need for new products, all tend to reopen the question of the possibility of utilizing profitably these farm products for some of the older uses, or for others which may be developed. The subject is ever changing and ever new. The Department of Agriculture has never lost sight of these facts. It is continuously giving consideration to the problem of the industrial use of farm wastes, both by initiating investigations, and by following closely the research work of industry and of inventors.

Fertile Field for Engineering

As a third phase of the matter, a fertile field for engineering research lies in the collection of farm wastes. The further development of some projects upon which the technological work has been completed depends upon the collection, transportation, and storage of the raw material. Just as the invention and development of the binder changed the whole aspect of a large part of grain agriculture, so the development of satisfactory machines for collecting them may alter the economic position of farm wastes. At present the farmer receives but little of the potential value of his cornstalks, his wheat straw, his cotton stalks, and his rice hulls. Most of the value goes to the man who bales it for him, or to the concern that carries it to its destination, or to the manufacturer of the finished product. When machinery for harvesting farm wastes has been designed and perfected the farmer should receive more nearly his just share of the value of the waste materials which, if he sells them at all, he sells for a pittance. What is more important, efficient collecting machinery will permit by-products now apparently worthless to be transported to market on terms of economic equality with raw materials at present monopolizing the field, and the waste, to-day a source only of worry and inconvenience, should take its rightful place among the income producers of the farm.

Finally, then, we see the utilization of farm by-products has always been, and naturally will continue to be, a subject of primary and deep concern to the Department of Agriculture. Chemical research has done much and more will be accomplished; but there is urgent need for a closer brigading of the chemical technologist with engineers and with economists to complete the task, in order to bring to the farmer the full value of the whole production.

W. W. SKINNER.

CHEMIST'S Field in Agriculture Almost Limitless in Scope

Agricultural chemistry may be defined as that branch of science which treats of the chemical composition and mutual chemical relations of soils, crops, and farm animals, in so far as they concern the production of the means of human subsistence and welfare. It will be seen at once that the field comprised by this definition is almost limitless. In the formation of soils by the weathering and decomposition of rocks, questions of geology, mineralogy, meteorology, and physics, as well as of chemistry, are involved. In the production of crops and farm animals we enter into the complex field of organic and physiological chemistry, to any single phase of which a chemist can devote the entire period of his life.

The first scientific contribution to be issued by the Department of Agriculture after its establishment in 1862 was a report by its chemist, Charles M. Wetherill, upon certain applications of chemistry to agriculture. The investigations which have been conducted, since this early publication, by the chemists of the department upon soils, fertilizers, crops, cattle feeds, fruits and vegetables, dairy products, meat and poultry, forestry products, leather and tanning materials, insecticides, road materials, and the various other commodities which are produced or employed by agriculture, are too numerous to mention. With the growing realization of the importance of chemistry to every branch of agricultural science, chemical methods and processes have been gradually extended from the Division, or Bureau, of Chemistry, where they were originally localized, to every bureau of the department. There are, however, many agricultural investigations which belong more appropriately to a distinctly chemical unit, and it is for the purpose of considering a few of those more specialized applications of chemistry to agriculture that the present article has been prepared.

Crop Chemistry

The opportunities which are open to the agricultural chemist in the field of crop chemistry are unlimited. Crops at one time were grown largely for net weight of production without much regard to the question of composition. But during the last century the capacity of a crop to produce some specific ingredient, such as sugar, oil, starch, cellulose, or protein, has attracted more and more attention. The classic example of what can be done in the improvement of a crop by chemical selection is the sugar beet, which, by the simple expedient of selecting for seed production only the roots of highest sucrose content, has had its sugar-producing capacity more than doubled.

The Bureau of Chemistry and Soils and the Bureau of Plant Industry are at present conducting collaborative investigations on the improvement of the chemical composition of citrus fruits by bud selection. There is room for vast research in this field.

Improvement of the chemical composition of crops by the application of special fertilizers opens up another line of promising investigation. The Bureau of Chemistry and Soils found that when sodium nitrate was applied to wheat at the time of heading, the protein content of the grain could be increased by several per cent, with a marked improvement in the nutritive value and baking properties of the flour. The effects of nitrogen, potassium, phosphorus, and other elements upon the chemical composition of crops, when applied at different stages of growth, still remain to be determined.

Maturity Standards for Fruits

The establishment of chemical standards for determining the proper degree of maturity at which fruits and vegetables should be gathered is another phase of crop chemistry which was developed by the Bureau of Chemistry and Soils. If gathered either too early or too late such products will reach the consumer in an inedible condition. The Bureau of Chemistry and Soils has established maturity standards for oranges, grapefruit, pomegranates, avocados, and other

fruits, and there is a constant demand by producers for an extension of the work in this field.

The Bureau of Chemistry and Soils has been engaged for many years in a series of comprehensive studies upon the chemistry of carbohydrates, proteins, oils, fats and waxes, essential oils, organic acids, and other special constituents of crops. This work is being actively extended, for it has a most important bearing upon the nutritive value and industrial utilization of all agricultural products.

Deterioration of Farm Products

The spoilage of agricultural products by the attacks of microorganisms offers an almost endless number of problems to the chemist. The souring of milk, molding of bread, swelling of canned goods, heating of cattle feeds, rotting of fruits, fermenting of sirups, and the decay of timber are all phases of the same general destructive process called deterioration. This process may proceed so slowly as to be barely noticeable from one day to the next, or it may proceed so rapidly as to cause a haystack to catch fire spontaneously and burn to the ground.

The loss which American farmers suffer from the deterioration of fruits, vegetables, grain, hay, feeding stuffs, leather, farm fabrics, and timber by means of bacteria, molds, yeasts, and fungi, amounts each year to several billion dollars. The chemical transformation which takes place in these different processes of deterioration are imperfectly understood, but investigations are now being conducted by the Bureau of Chemistry and Soils on the nature of the destructive changes produced and on the means for their prevention.

Agricultural Chemical Technology

Another important field of agricultural chemistry is the technical utilization of the crops, fruits, milk, and other commodities which are produced upon the farm. The manufacture of sugar, sirup, vinegar, butter, cheese, dried apples, and many other farm products necessitates a thorough knowledge of chemistry at every step of each process. Improvements in the tanning of leather, in canning of vegetables, dehydration of fruits, crystalling of sugar, pressing of oil, distilling of turpentine, and in the utilization of lemons for citric acid and other by-products are illustrations of the work which the Bureau of Chemistry and Soils has accomplished in this field.

The opportunities are almost unlimited, for much remains to be done in the chemical utilization of agricultural residues. Thousands of tons of straw, cornstalks, and similar refuse are wastefully burned each year for the purpose of disposal. The Bureau of Chemistry some years ago developed a process for manufacturing the valuable chemical furfural from cellular wastes, and this is now being applied on an increasing commercial scale.

The Bureau of Chemistry and Soils is at present investigating the chemical utilization of lignin, a cellular complex which constitutes over 25 per cent of the dry weight of straw, cornstalks, and similar agricultural refuse. Lignin probably offers as many methods of utilization in the manufacture of tanning materials, dyestuffs, and other industrial products as was offered 80 years ago by that other trade waste, coal tar, which, through the ingenuity of the chemist, has proved to be an almost inexhaustible ource of wealth.

Agricultural Chemical Analysis

The agricultural chemist is constantly being called upon to improve his analytical methods for the purpose of determining the quantities of some of the less abundant and hitherto neglected constituents of foods. The needs in the diet of fluorine for teeth formation, of iodine for the prevention of goiter, of iron for the production of haemoglobin, and of other less common elements for specific physiological uses, call for a greater improvement in many of our analytical processes. The reputed beneficial effect of minute quantities of certain food constituents such as boron, zinc, and manganese, and the surmised injurious effects of traces of certain mineral and organic ingredients are additional reasons for devoting more attention to analytical refinements. The improvement of methods of agricultural chemical analysis constitutes a most important part of the work of the Bureau of Chemistry and Soils.

The lines of investigation which have been briefly summarized in this article constitute only a few of the more important applications of chemical research to agriculture. Agricultural chemistry is a comprehensive term which includes not only chemistry but also mineralogy, physics, meteorology, plant and animal physiology, mycology, and other correlated sciences. The agricultural chemist must be a scientist of broad attainments, for it is in the borderland where chemistry and the other sciences overlap that agricultural research will make its greatest advancement.

C. A. Browne.

Chemists in Front Ranks in Warfare on Harmful Insects

Insects cause the people of the United States an estimated annual loss of $2,000,000,000. This sum is exclusive of the economic loss suffered from insect-transmitted diseases, such as malaria and yellow fever.

An unceasing warfare exists between man and insects, and some entomologists have predicted that insects, and not man, shall inherit the earth. Certain it is that the struggle to produce food and clothing grows yearly more severe as a result of the destructive activities of insects.

In this warfare against injurious insects, man is assisted by their natural enemies, such as birds and the parasitic insects, nemas, protozoa, bacteria, and fungi. Of even greater importance in curbing insect pests is climatic control. Without the natural control of heat, cold, wetness, and dryness, the multiplication of many insects would proceed unchecked, and man would be swept from the face of the earth. In spite of all these methods of control, however, man would continue to fight a losing battle if he could not avail himself of the aid of certain chemical compounds known as insecticides.

An insecticide is any material which will destroy, repel, prevent, or mitigate an insect. For convenience, insecticides are commonly classified as contact poisons, stomach poisons, and fumigants. A contact insecticide is one which will kill an insect merely by coming in contact with it. In this class are nicotine, pyrethrum, and soap and oil emulsions. A stomach poison is one which kills the insect only when taken into the digestive system of the insect. In this

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class are the arsenical insecticides, such as lead arsenate, calcium arsenate, and Paris green. Still another class of insecticides comprises the fumigants. Fumigants are gases or materials that give off gases which kill insects exposed to them. Fumigants are the poison gases in the warfare of man against insects.

Since the general problem of insect control is that of the economic entomology, it may be asked where does the chemist come upon the scene? The chemist is essential in the warfare between man and insects, since insecticides are discovered and manufactured by him.

Some Insecticides Discovered Accidentally

The discovery of many materials now used as insecticides has been accidental. The use of several of our present-day insecticides dates back 300 or more years. For example, the use of a mixture of honey and white arsenic for poisoning ants was described over 200 years ago in English agricultural books. The use of soot, lime, lye, sulphur, and tobacco as insecticides appears to have been known in England at the time of the first published works on agriculture. The fact that the flower heads of certain species of chrysanthemum were effective in killing fleas and other insects was known to the inhabitants of Caucasia as early as the beginning of the nineteenth century. This product under the name of pyrethrum or insect powder is to-day one of the most widely used insecticides.

Within recent years, however, the discovery of the insecticidal value of materials has been made by chemists and entomologists. For example, the use of lead arsenate as an insecticide was proposed by a chemist. To-day this is one of the most valuable insecticides for use against chewing insects. Paradichlorobenzene, which was first proposed for use as an insecticide by a German chemist, is the only chemical means of control employed in this country against the peach-tree borer. Sodium fluoride and sodium fluosilicate were patented by an English chemist for use against roaches. The former is a valuable insecticide for use against lice on poultry; sodium fluosilicate has shown promise in tests for the control of the Mexican bean beetle, the cotton boll weevil, and other destructive insects. Chloropicrin was patented as an insecticide by an Austrian chemist several years before it came to the attention of entomologists. It is reasonable to expect that chemists will discover new insecticides.

Encouraging progress has been made in chemotherapy, that is, the development of chemical compounds for the control of specific disease organisms. The future development of insecticides may be along similar lines, namely, the development of more specific poisons for insects. The organic chemist will be called upon for an advance into this field, because the materials which are most deadly to insects and yet least toxic to man are of an organic nature. For example, the active principles of pyrethrum are among the most effective insecticides known, yet they may be applied to vegetation without injurious results and have very little, if any, injurious effect upon man. For the synthesis of compounds of this nature the organic chemist must be consulted. Compounds even more toxic to insects than any now known may be prepared in the laboratory by those who have made a study of the relations between chemical constitution and toxic action.

Chemists in Insecticide Production

After a new insecticide is discovered, its production on a large scale must be entrusted to the chemist. The manufacture of certain insecticides, such as lead arsenate, calcium arsenate, Paris green, lime-sulphur solution, nicotine, paradichlorobenzene, the cyanides, carbon disulphide, and Bordeaux mixture constitutes a large and growing industry in this country. All these materials are made by chemical manufacturers under the direction of trained chemists.

The inspection of manufactured insecticides is again a function of the chemist. Before the passage of the insecticide act of 1910, commercial insecticides were frequently adulterated. A farmer often received gypsum mixed with a green dye when he thought he was purchasing Paris green. The establishment of a standard for insecticides and the inspection of commercial samples to see if they meet that standard have been most valuable contributions of the chemist to the problem of insect control.

The chemist plays an important rôle in the warfare against insects because he must be depended upon for the discovery of new insecticides, for the manufacture of insecticides, and for inspection of insecticides after manufacture to determine if they meet the requirements of law.

R. C. Roark.

CHESTNUT Killed by Blight Replaced by Other Valuable Trees

During the last 25 years, on millions of acres in the eastern United States, chestnut, which once supplied a greater variety of valuable wood products than any other native hardwood, has been killed by the chestnut blight—a fungous disease from Asia. Failure of determined efforts to stop the spread of the blight has made it appear certain that chestnut will soon disappear as an important timber tree in the eastern forests. As a result timberland owners have been forced to turn attention to the salvage of the chestnut timber and its replacement in the forest by other valuable trees.

Strength tests conducted by the Forest Products Laboratory indicate that sound wood from blight-killed trees is fully as strong as wood from healthy trees. However, in trees killed from any cause, checking is likely to occur with the drying of the wood. Checking in small trees will start the second year after the blight has completed its work, and in all trees is rapid after the fifth year. When checking becomes serious the value of the timber is greatly lessened for purposes other than fuel or extract wood. For these reasons and to avoid loss from decay or from worm attack it is desirable to cut blight-killed trees promptly. Also, owners of chestnut, whether sound or blighted, should get rid of it at the first opportunity in order to avoid a possible glut of the market, which becomes more likely as more timber is attacked in a locality.

Nearly all the mature chestnut in southern New England, southeastern New York, New Jersey, eastern and central Pennsylvania and Maryland, and northern Virginia has been killed. Extensive infection occurs throughout the mountain region of West Virginia, western Virginia and North Carolina, eastern Tennessee, northern Georgia, and northwestern South Carolina. (Fig. 45.)

FIG. 45.—A young stand of chestnut poles killed by the blight. Most of the live trees are chestnut oak. Here the loss was great not only because of the death of many trees not yet merchantable but also because the chestnut was replaced with slower growing species

On areas where the chestnut has been dead for several years the blight-killed chestnut has been replaced naturally by oak—red oak, white oak, chestnut oak, black oak, or scarlet oak. (Fig. 46.) Such other valuable timber trees as white ash, sugar maple, hickory, and

FIG. 46.—A well-managed stand of second growth hardwoods. The chestnut has been salvaged and the stand, now composed chiefly of oaks, has fully recovered and contains ample reproduction to keep the area fully stocked

sweet birch are often associated with the oak. Although much of the eastern hardwood forest is still lacking in volume of wood to the acre, it is making good progress toward recovery.

Increased Growth of Oaks

The stand remaining after the death of the chestnut, composed mainly of oaks, has responded to the increased growing space with increased growth. The crowns of the trees are very effectively closing the smaller openings left by the chestnut. This increased growth rate, however, is smaller than was the growth rate of the chestnut.

Stands running heavily to chestnut should be practically clear-cut, seed trees of valuable species being left to restock the area. Because the land is generally restocked naturally by other valuable kinds of trees planting is not recommended as a method of replacing chestnut in the eastern hardwood forests. In addition to the actual cost of planting there would be added that of the weedings and thinnings necessary to prevent the planted trees from being shaded out, and the combined cost will rarely be justified except when natural replacement fails.

CLARENCE F. KORSTIAN.

CITRUS By-Product Plants Cut Waste and Sustain Prices

Citrus fruit requires a subtropical climate for its growth and is therefore restricted to the southernmost parts of the United States. Frequent periods of severe cold have tended to centralize the industry in favored localities in California and Florida. As these districts have for some time produced more than sufficient fruit to supply the demand in this country, the problem of disposing of the surplus and cull fruit is an important one. The total shipments are over 40,000,000 boxes. A minimum of 5 to 10 per cent of the production can not be shipped, owing to defects. At times, on account of freezes, excessively hot weather, or unfavorable marketing conditions, the surplus and defective fruit amounts to from 25 to 50 per cent of the total production. The cost of growing, picking, and hauling this material to the packing house is, of course, the same as for good fruit.

It has long been recognized that any method by which some return could be made to the grower for this part of his crop would be of immense benefit to him. Not only would he be paid part of the expense of producing the fruit; but, provided the by-product industry was sufficiently elastic, he might be able to dispose of a large amount of the surplus which if shipped would demoralize the market for the better grades.

The initial efforts in the direction of by-product plants were made by business men who entered the field for the profit they believed to be certain. Most of these efforts had serious defects, any one of which would have rendered them failures. They were not sufficiently capitalized, their backers did not recognize the necessity of technical or chemical control, and their production and selling organizations were not properly balanced.

Cooperative By-product Plants

Out of the failures came the idea of cooperative by-product plants to be operated solely as a means of salvaging fruit and returning a part of its cost of production to the grower. About 10 years ago, the first plant of this kind was organized by California growers to salvage lemons. After the usual troubles resulting from the adaptation of processes to new conditions without proper technical control, an adequate chemical and engineering staff was assembled, and in 1927 the plant processed 75,000 tons of lemons, a part of which would have been offered for sale not only without profit but with certain demoralization of the market.

Three principal commodities are made from lemons—oil of lemon, which comes solely from the peel; citric acid, which comes from the juice; and pectin, which comes from the peel and from the pulp after the juice has been extracted. Citric acid is used in the manufacture of beverages such as ginger ale and soda waters, in effervescent salts, and in other pharmaceutical preparations. Oil of lemon is used for flavoring purposes. Pectin is used largely in making jellies and preserves. The annual capacity of the present lemon by-product plant is over 3,000,000 pounds of citric acid, 250,000 pounds of pectin, and several hundred thousand pounds of lemon oil. The production of the lemon oils is controlled largely by the class of fruit received by the factory. The returns to the grower from these products will average between $8 and $12 per ton of fruit. The average cost of growing lemons in California is about $35 per ton, which clearly demonstrates that the lemon by-product industry is strictly a salvage one.

It is not possible to produce citric acid profitably from either oranges or grapefruit, but the juice of these fruits is more readily prepared for the market than lemon juice. Many more attempts have been made to establish orange by-product factories than any other kind. This is due to the fact that more products can be produced, more fruit is available, and that the orange is the most popular of the citrus fruits.

Concentrated Orange Juice

The wide advertising campaigns based on the vitamin content of oranges have increased the demand for the juice enormously, therefore the main efforts of these concerns have been to produce a satisfactory bottled juice. After many failures, at least two concerns, one of which is cooperative, are making large quantities of concentrated juice. This juice is diluted and used as a base for orange drinks.

At least one orange by-product factory is producing orange oil, both cold pressed and distilled. The annual production is less than 50,000 pounds of the cold-pressed oil and somewhat more than that quantity of the distilled oil. These oils are used for flavoring purposes and perfumes. As yet none of the orange by-product concerns have begun making pectin, although there seems to be no reason why this commodity can not be profitably made from the peel and pulp.

Dried orange peel, candied peel, and various other confections are prepared, but the consumption of fruit for such purposes is comparatively small. A satisfactory cattle and chicken food is made by

drying the waste peel and pulp from the larger factories. Altogether about 20,000 tons of fruit were processed by the orange factories in 1927.

Grapefruit by-products consist largely of canned grapefruit which is put up in Florida. Some 600,000 cases were produced during the season of 1926 and 1927.

E. M. Chace.

CITRUS Canker Under Control and Final Eradication Expected Since 1915 the Bureau of Plant Industry and the agricultural officials of the Gulf States have been cooperating in the effort to eradicate citrus canker. The disease usually appears as a fruit spot and leaf spot, but may affect bark, and is so contagious that burning infected trees has been found to be the only method practicable for stamping it out.

Although the disease is not entirely eradicated from the United States, the very rapid reduction of infected trees and the thoroughgoing success in preventing epidemics in commercial regions indicate the effectiveness and value of this campaign and support the belief that final and complete eradication of citrus canker will be accomplished.

In the State of Florida canker has been found in 25 counties. The following figures give an estimate of the results of the campaign in the number of infected grove trees found: 1916, 2,294; 1917, 372; 1918, 15; 1919, 4; 1920, 540; 1921, 0; 1922, 873; 1923, 11; 1924, 0; 1925, 5; 1926, 2; 1927, 85.

In July, 1920, after it had been thought that Florida was free from canker, it was again found in an isolated grove, where 540 infected grove trees were destroyed. Immediate steps were taken for a complete reinspection of the entire area, but no more infected trees were found. In September, 1922, there was discovered an epidemic where 884 grove trees scattered through 22 properties were found infected and were destroyed. The last infected tree in this locality was not found until October, 1923. Since that time, with the exception of 5 infected trees discovered in March, 1925, and 2 infected trees in December, 1926, the State was free from canker until November, 1927, when a more serious infection was reported; 85 trees on two properties were found infected, and it was necessary to destroy approximately 200 grove trees adjacent to the infected trees.

At various times canker infections have occurred in 15 parishes in Louisiana. Since 1916 the disease has been found in but 5 parishes. Major efforts in this State have been devoted to old infections. New trees are planted only under permit, to prevent owners from planting trees in infected soil or in close proximity to soil from which canker-infected trees were removed. Because of scattered infections in dooryard plantings, it is thought that it will be several years before the disease is completely eradicated from Louisiana.

Since 1916 canker has been found in nine counties in Texas. From 1916 to 1927 it has been necessary to destroy 28,214 grove and 257,658 nursery trees. The only known infection in Texas at the present time is at Smith Point.

In Alabama canker has been found in five counties. Since the beginning of the campaign, 105,038 grove and nursery trees located

on 621 properties have been found infected. No canker had been found in Alabama from June, 1923, until June, 1927, when one infected grove tree was found and promptly destroyed.

In Mississippi canker was found in four counties. During the entire campaign 3,110 grove trees and 51,137 nursery trees were found infected. The infected grove trees were found and destroyed as follows: 1916, 2,724; 1917, 345; 1918, 10; 1919-20, 0; 1921, 1; 1922, 30. It is believed that Mississippi is now free from canker.

In Georgia canker infections were found in two counties, but the State has been free from the disease since 1918.

K. F. KELLERMAN.

CLOTHING Still Often Homemade on Farms to Large Extent Changing economic and home conditions are undoubtedly lessening the kinds and amount of clothing being made at home. The ready-to-wear industry is constantly enlarging, and now it is possible to buy ready made practically every kind of garment needed. More women than ever before are working outside the home, and consequently have less time to make clothing. Many also feel that the time spent in making clothing might better be used in outdoor and social activities. Conditions still exist in many homes, however, which make it imperative that all or a part of the clothing be made by the family.

Just how much clothing construction should be included in extension programs and in schools is a question often up for discussion. The Bureau of Home Economics also needed facts on present trends in home sewing as a basis for its research. Figures have consequently been gathered by means of a survey in which nearly 2,000 families in 32 States are represented. More than half of these families lived in rural or village communities, and the income of over half of them was less than $3,000 a year.

Of the 32 garments listed for men, women, and children, nearly 70 per cent of the women stated that they were making 9 or more kinds of garments. Over 35 per cent were making 1 or more kinds of garments for men; 80 per cent were making nightgowns, aprons, house dresses, and summer wash dresses for themselves or for the girls of the family; 30 per cent made hats, and nearly 25 per cent made coats. More than 60 per cent said they were making silk and wool dresses.

Reasons for Home Sewing

Over 90 per cent gave lower cost as their reason for making clothing at home. More than 75 per cent said that there is better material in homemade garments, over 50 per cent that the homemade garments more nearly met their individual needs, and less than 8 per cent that good stores for ready-made garments are inaccessible. Many women volunteered the reason that they sewed because they enjoyed it.

On the question of ready-made clothing about 70 per cent of these women said that they bought in order to save time and energy and because of better style and design in the ready-made garments. Only 25 per cent stated that they were unable to make the clothes at home that they bought ready made. Over 75 per cent of the women remade garments for men, women, or children.

The most outstanding difficulty with home sewing seemed to be fitting, and the next greatest problem was choosing becoming and practical designs. The difficulty which was reported the least number of times was using patterns.

Sewing machines were in practically 90 per cent of the homes. Seventy-five per cent of these machines were run by foot power and 15 per cent by motor power. Nearly 40 per cent did not tell whether they were using the attachments of their machines, which would indicate that they did not. Only 5 per cent said that they used all of them.

From these figures it would seem that certain types of garments are rather generally made at home, especially in the rural communities. Also it appears that home sewing will continue to hold its own to a certain extent, for the simple reason that women like to make some of their own or their family's clothes, whether it is or is not economical of time or money.

MAUDE CAMPBELL.

COD Liver Oil, Rich in Vitamins, Loses Value in "Extracts" Studies carried on in many laboratories during the last 20 years have shown that animals will not grow and maintain health on a diet of pure proteins, carbohydrates, fats, minerals, and water, all of which are essential in an adequate diet. Other factors, called vitamins, must be present in the food or the animal will die.

The disease symptoms resulting when any one vitamin is not present in the diet are quite specific. It is possible to detect the presence of any vitamin in a food by including that food as the only source of the vitamin in question in addition to a diet which is totally free from this factor but contains all other food essentials. If the food supplies the missing vitamin, the animal will grow and remain healthy. If it does not supply this factor, symptoms will develop due to a lack of this vitamin in the diet.

Two of these food essentials have been named respectively vitamin A and vitamin D. Vitamin A occurs in such foods as milk, eggs, butter, green leaves, some vegetables, and cod-liver oil. When animals are fed a diet containing all food essentials except vitamin A, growth ceases and there is loss of weight. Certain parts of the body such as the eyes, membranes lining the air passages of the nose and glands in the mouth may become infected. Such occurrences are convincing evidence of the fact that an abundance of vitamin A in the diet is essential for the growth and well-being of the animal. Vitamin D, which occurs in egg yolk, butter, milk, some vegetables, and cod-liver oil, must be present in the diet if normal bone growth is to take place.

Cod-liver oil is an especially rich source of vitamins A and D and is used in infant feeding and cases when it is desirable to supply an abundance of these two factors in the diet. In many instances, however, cod-liver oil may cause digestive upsets, and it would be advantageous to be able to use an extract of cod-liver oil containing these two vitamins but without the objectionable oil. Several such extracts are for sale by different manufacturers. In order to be sure that the extract in question actually contains all of the vitamins present in the original cod-liver oil, feeding experiments

must be made. Such tests in which white rats are used are carried out in the nutrition laboratory of the Bureau of Home Economics.

Vitamin A Not Found in the Preparation

During the last year, in cooperation with the Bureau of Chemistry and Soils, one of the widely used alcohol extracts of cod-liver oil was tested for the presence of vitamins A and D. Over 250 animals

FIG. 47.—A rat which was fed cod liver oil extract as the only source of vitamin A in the diet

were used in making the tests, which lasted for a period of about nine months. The results showed that this extract did not contain any trace of vitamin A, although cod-liver oil is rich in this factor. Figure 47 shows a rat which had been fed the extract as the only source of vitamin A in its diet; Figure 48, a rat which had received cod-liver oil as the only source of vitamin A. The tests for vitamin D showed that the extract contained some of this factor but not so much

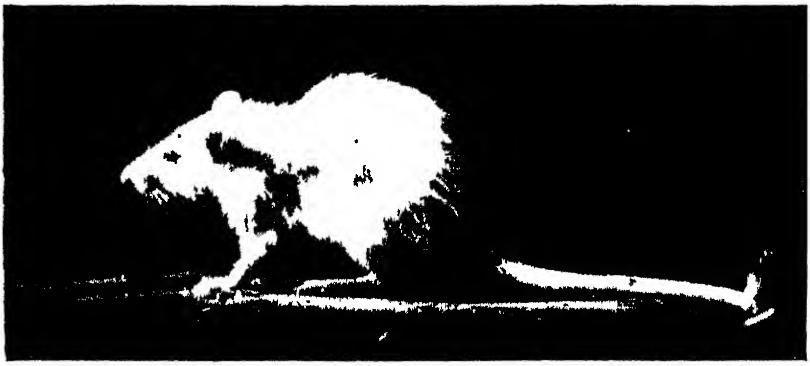

FIG. 48.—A rat which was fed cod-liver oil as the only source of vitamin A in the diet

as the original cod-liver oil, and was in no sense a concentrate of vitamin D.

This extract was extensively used as a source of these two vitamins, and yet it contained no vitamin A and only a fraction of the vitamin D present in the original cod-liver oil. Such results show the necessity of constantly checking any products of this kind to make certain that they come up to the claims made for them.

HAZEL E. MUNSELL.

COOPERATION as High School Study Is New and Promising Move Teaching of cooperative marketing in agricultural high schools or in agricultural courses given in town or city schools is a comparatively recent development. The first course of this kind of which the department has record was begun in 1908 in a New York State school; the second, in 1913, in a Massachusetts school. Up to 1919, apparently, less than 1 per cent of the agricultural high schools in the United States were teaching cooperative marketing. A recent survey indicates that approximately 85 per cent are now giving some form of instruction in this subject.

Few special courses in cooperative marketing are offered by the high schools. In the survey only 74 out of approximately 1,500 schools reported that they were giving such courses. Usually cooperation is taught in connection with commodity projects, or in courses devoted primarily to farm management, agricultural economics, or kindred subjects. About 55 per cent of the schools from which reports were received taught cooperation in connection with commodity projects and approximately 54 per cent in general agricultural courses.

Textbooks dealing with cooperative marketing, or the general marketing of farm products, are used to a limited extent, but these are not always suitable for high school use. The majority of teachers are dependent upon State and Federal bulletins and in some instances upon reports of cooperative associations or articles in farm papers.

Altogether it is indicated that approximately 50,000 students were given some degree of instruction in agricultural cooperation by the high schools during the school year 1926–27. Presumably the majority of these students will take up farming as their vocation. Reports from 203 schools in 40 States show that 1,386 of their students are already members of cooperative associations. Apparently about half of all students studying agricultural cooperation in the high schools are the children of members. They have a farm background and some contact with the work of cooperative organizations. The schools endeavor to give them an understanding of the marketing problems of their community and a broad picture of the accomplishments, possibilities, and problems of cooperative marketing in the United States.

Products Grown Sold Through Cooperatives

Of the schools teaching cooperation, 43 per cent reported the sale of products grown in school projects through cooperative associations. The Alabama schools were the leaders in this activity, 77 per cent reporting the sale of products cooperatively. In addition, 48 per cent of the schools reported that their students visited, as a class, the offices and plants of cooperative associations on the average once each year. Thirty-two per cent reported that representatives of cooperatives talked to their classes once or twice a year.

Night courses for adults were reported by 154 schools. Instruction of this kind is attracting interest in many sections, and there seems to be opportunity for a joint program conducted by extension workers and agricultural teachers.

The principal needs of the agricultural teachers are assistance in outlining work in cooperative marketing and teaching material. The teachers need unbiased, up-to-date information as to what the associations are doing, what they have accomplished, what their limitations and problems are and the trends in the movement. They want assistance in planning community surveys, in giving their students an understanding of community problems, and in making clear to the students their relationship as prospective farmers to the problems of marketing.

A. W. McKay.

COOPERATIVE Cotton Gins as Local Units of Marketing Associations

Cooperative cotton gins, as economic local units of the centralized State-wide cooperative cotton-marketing associations, are developing rapidly. At least four of the large cooperative cotton-marketing associations have already entered the ginning field and have organized one or more cooperative gins. Five gins were operated by state-wide cotton-marketing associations during the 1926–27 ginning season and 25 during the 1927–28 season.

Cooperative ginning is not entirely new among cotton producers. For many years the cotton gins in a number of communities have been owned and operated by groups of producers. The combination of cotton ginning with cooperative marketing is a recent development, however, and its possibilities are attracting the attention of leaders in the cooperative marketing of cotton. Most cooperative or community gins have been owned heretofore by farmers' stock companies which failed to provide for perpetual farmer control and refund of savings on a patronage basis. They were ordinary corporations in which most of the stock was held by producers.

This form of organization was frequently unsuccessful because it permitted the stock to pass into the hands of nonproducers and finally resulted in loss of control by the farmers. The more profitable the business became the more rapidly the nonfarmer interests seemed to obtain control. Success spelled failure so far as farmer control was concerned.

The most signal success of independent cooperative gins has been achieved by a group of about 20 organizations in northwest Texas since 1920. The experience of this group of gins indicates that volume is one of the essential factors necessary for efficient operation, and that where there is the right kind of cooperative effort among the producers this factor is easily controlled. The gins are financed partly by the sale of membership certificates, a form of stock, to members and partly by borrowing from banks and by favorable credit arrangements with the manufacturers of ginning machinery. In many instances the savings from two or three years of operation have been sufficient to cover the entire cost of the gin plant. These cooperative gins charge the same for ginning as do their competitors. After paying all debts the balance of savings is distributed to members on a patronage basis.

Growers Are Enthusiastic

It should be borne in mind that every community does not have equal opportunity to do what these northwest Texas communities

have accomplished. Each community must carefully consider the factors in its own environment which determine its chances of success in such an enterprise. Some of the most essential of these factors are the present local ginning service, the trend of cotton production, the consistency of yields and acreage, the competition of near-by trading centers, and the attitude of the growers toward cooperation.

Much has been gained by the organization of independent cooperative gins by the cotton growers, but apparently there is an even greater opportunity for economic service and savings to cotton producers by the development of gins as integral units in the cooperative cotton-marketing organizations. This is being done by some of the state-wide cooperative cotton-marketing associations, in the belief that the gins will furnish the associations with contact points and at the same time assist the growers in obtaining excellent gin service. The gin manager will act as the representative of the association in the community

His duties will be to see that the growers' cotton is properly ginned and pressed and to receive and ship the cotton, thus saving the grower trouble and uncertainty in the execution of the papers necessary for shipping and in obtaining advances at the local bank. The gin manager may assist in the selection of seed varieties adapted to the soil and climatic conditions of the section, and in maintaining pure varieties by directing breeding work and by proper handling of cotton at the gin. In other words, he should be a large factor in the promotion of a one-variety community. The net result of such a program will be a profitable interrelation of the production, processing, and merchandizing phases of cotton marketing.

Subsidiary Corporations Formed

The gins organized so far by cooperative cotton-marketing associations are subsidiary corporations. The association holds the majority of the stock and the grower members in the community hold the remainder. By accepting members' notes for gin stock and using money from reserves to discount them, the associations have sold the stock readily and distributed it widely among the membership in the community.

Each cooperative gin is a separate and distinct corporation. Financial control is nominally in the hands of the association, but it is the policy of the associations to let the directors of the local gins have a large part in their management.

Because of its centralized control of a large number of cooperative gins the association can purchase cooperatively gin machinery, bagging and ties, coal and fuel oils, cottonseed for planting purposes, and other necessary supplies. This should result in large savings. Also, cottonseed may be handled cooperatively to advantage.

Cooperative gins as local economic units of state-wide marketing associations are relatively few as yet; but the experiences gained so far are encouraging and indicate opportunities for greater expansion.

James S. Hathcock.

COOPERATIVE Marketing of Grain May Be Extended For more than 50 years farmers' elevators have been a factor in the marketing of the grain crop of the United States. The increase in number of such elevators since 1905 has been particularly noteworthy. About 3,500 farmers' elevators reported to the United States Department of Agriculture in 1926.

As organized in this country, the farmers' elevator is a local enterprise established and controlled by local grain producers. It is an independent agency competing with private business organizations and with other farmers' elevators. In the handling of grain its practices are those of the trade in general. The grain is handled in the most approved manner and is disposed of through the established channels of trade.

The accomplishments of farmers' elevators have been marked, although it is impossible to measure their value in money. They have unquestionably resulted in increased returns to farmers, besides improving the conditions under which grain is handled at country points. In addition to their activities as grain-handling agencies, a large proportion of farmers' elevators purchase supplies for their members and patrons and some engage in the shipping of livestock. Because of this diversity of interests, they are recognized as important local business units.

In view of the accomplishments of farmers' elevators one may well ask why farmers are not entirely satisfied with the results achieved. The answer is probably to be found in the statement that there is more to the marketing of grain than the mere handling at country points. As a marketing agency the farmers' elevator is probably not in a position to be as successful as it is in the matter of country handling. Successful marketing requires a coordination of supply and demand which can be accomplished only by an organization which has a knowledge of demand conditions and which handles a reasonable volume. The local farmers' elevator, therefore, is not in a position to achieve maximum results as a marketing agency.

Grain Marketing Progress Retarded

For several decades the tendency of business, both private and cooperative, has been toward consolidation. In the marketing of our grain crop we have not kept abreast of the times. For that reason there have been in recent years attempts to introduce new types of agencies, controlling considerable volume and selling as nearly as possible direct to millers and other users of grain. This development has been furthered by the accomplishments of Canadian farmers who, for 20 years, have successfully managed large-scale cooperative agencies for handling grain.

Although differing in methods, the Canadian organizations have certain common characteristics. Among these are the operation of country and terminal elevators and the conduct of sales operations in terminal markets. In each case they control sufficient volume to be an influential factor in country and terminal operations. In brief, Canadian grain producers have applied the principle of large-scale operation in keeping with the practices of private grain handlers and the trend of business in general.

It must be recognized that conditions in the United States and Canada, though similar, are not identical. There is, however, sufficient resemblance to strengthen the belief that organizations similar to those conducted in Canada may be operated successfully here.

Farmers of the United States are studying the advantages to be gained by extending their marketing operations beyond the country elevator stage. If progress is to be made in this direction, it will be necessary to compromise to a considerable extent. The good features of existing agencies as well as their limitations must be recognized.

If anything is to be gained by further developments in grain marketing it is likely to come from a closer coordination of country and terminal elevator facilities with centralized buying and selling. There are those, however, who contend that nothing will be gained by such an extension of activities. But there are some rather interesting results. Recent developments in our terminal grain markets, concerning which comparatively little has been said, indicate increased interest in this subject. Although there are differences of opinion concerning the methods to be pursued, there appears to be agreement on at least one point—that the interest of farmers in farmers' elevator companies does not end with the delivery and handling of grain at country points.

J. F. Booth.

COOPERATIVES are Making Progress in Budget Control

Efficient management of cooperatives is fundamental to continued successful operation. It is especially important in farmers' marketing organizations because of the peculiar psychology involved and the large number of individuals directly interested.

If any one lesson was learned from the World War and the aftermath of the war by American business, it was the imperative need of more careful and exact plans for the future—plans based upon facts carefully analyzed and digested. The answer to this need has been the application of scientific analysis to business operations, and the development of a method of checking up on current operations, which is usually called "budgetary control."

Low costs of operation, high sales prices, and similar tests of satisfactory operation, which are usually applied to business, are valuable only when it is possible to compare them with some standard, or with the same items in other organizations that operate under similar conditions and perform similar services.

But any attempt to apply such comparative tests to farmers' cooperative associations as a means of determining how satisfactory their operations have been, and the point at which efforts toward improvement should be directed, meets some almost insurmountable difficulties. Little information is available in the form of comparable costs for similar organizations, and prices realized by competitors are not given much publicity. Further, the incidental services performed by cooperatives for their members are much more numerous than those performed by private organizations, and even the marketing services are seldom identical. To compare costs and results under such unlike conditions is of little use.

What Budgetary Control Can Do

What can be accomplished through budgetary control may be summarized briefly as follows:

(1) Budgeting substitutes definite facts and figures for guesswork and intelligent planning for blindfold fumbling.

(2) It employs and enforces cooperation.

(3) It serves to materialize contemplated actions in such a way that the probable results are known before the actions themselves are set in motion.

(4) It helps to restrain unwise expansion.

(5) It provides a unified plan of operation—a financial working plan which, as every executive knows, is of the utmost value to any enterprise.

Many cooperatives consider themselves to be operating on a budget. In almost every case the budget is an estimate of total expenses for the coming period presented either by the chief executive, or by the board, approved and put into the minutes. This is the only use made of their budget. Such action is a long way from budgetary control, because if an association is really operating under such a system in a way to make it of any value, it is essential to check up every month.

In establishing a budgetary control system it is imperative to know approximately what is to be done, who is going to do it, and how it is to be done. In other words, there must be a definite, concrete plan of organization, something that is absent in most businesses. From the manager down to the least important helper, there must be a clearly understood, positive line of responsibility and authority. It is impossible to formulate a budget, or to operate satisfactorily on a budget, without having a definite form of organization understood by everyone in the concern. Once a budget system is under way, the results must be checked at every turn. Budgetary control, more than any method yet evolved, will improve the efficiency of management and reduce waste effort and useless expenditures, because it enforces the development of carefully thought-out plans to meet situations as they arise.

A. V. SWARTHOUT.

COOPERATIVES Consider the Possibilities of Joint-Selling Plans

Seasonal marketing is present to a large extent in the cases of most agricultural commodities, particularly those of perishable or semiperishable nature. Cooperative managements are confronted by the problem of maintaining economically an all-year organization for the sale of products whose marketing is essentially seasonal in character. Reducing the number of employees in the sales organization or disbanding it when the commodity is moving in small quantities has distinct disadvantages, as trained personnel can not usually be found on short notice or developed immediately when the need arises. As a result many cooperatives have found it advisable to keep their sales organization intact throughout the year or to retain at least the more important members of its personnel during the slack season.

Cooperative managements are considering the possibility of using a sales organization jointly with other cooperative associations. The

department has recently completed a study of a joint sales arrangement between two cooperative associations which has been in successful operation for a period exceeding 25 years. One of the associations, for the sale of its product, has the use of the salaried sales organization which is maintained by the other association for the sale of its product, so that the arrangement is not one of complete joint control and joint sharing of maintenance expense. Each association does, however, have complete control of the sales organization in so far as the sale of its own product is involved. In each case the commodities handled are of highly perishable nature with slight exception, so that once the products are ready for market there must be no delay in their movement into consumers' hands.

Factors in Joint Operations

In this study certain factors were indicated which will be of material importance in the successful operation of similar sales arrangements. (1) The commodities of both associations should be sold to the same distributors, thus eliminating the necessity for the development of two distinct groups of customers and bringing about more frequent contact with trade members. (2) The possibilities of friction, resulting from disagreements with customers, which might arise from the sale of the products of two associations may be reduced through the employment by both associations of the highest standards of grading and packing. (3) A high degree of cooperation should exist between the two association managements so that the interests of the shipper members of both associations will be protected. Such a joint-sales arrangement requires an ability and a willingness on the part of each management to evaluate its own contemplated action not only with relation to the interests of its own shippers, but also in the light of the interests of the shippers of the other association. (4) A thorough understanding by the members of each association of the general principles and effects of the joint-sales arrangement is required to avoid misunderstanding of the intent and operation of the joint arrangement. (5) The relations of the sales personnel to each association should be definitely prescribed and understood. (6) In so far as possible the customers should be made acquainted with the separate identity of each association so that transactions and policies of each association may be attributed to the proper source. Thus an unfavorable reaction toward one association need not influence customers against the products of the other association. (7) There should be an equitable distribution of the annual joint cost of maintenance between the associations using the sales organization.

K. B. Gardner.

COOPERATIVES Find Membership Problem Has Complex Phases Cooperative marketing associations have developed rapidly during the last 15 years and have made marked improvements in marketing services and methods. During the early years of their existence, before methods and trade connections were fully established, they encountered many marketing problems. Managers of ability soon saw a remedy in the application of the sound business principles that had been devel-

oped by private business. Cooperatives are thus heirs to the experience of other forms of business enterprise in the actual marketing processes.

Other problems arose from the relations of the membership to the organization; in the solution of these problems cooperatives are breaking new ground. The relation between a cooperative and its members differs greatly from the relation between a corporation and its stockholders. The cooperative is directly dependent on its members for volume of business and the quality of products handled. The members, by their votes, select the directors, who in turn select the management.

After a cooperative has secured good management, the attitude of the members toward the organization and their lack of understanding of the possibilities and limitations and of the problems confronting the organization, may be the greatest obstacle to further expansion and development of the cooperative. Misconception as to the purpose or economic functions of cooperative marketing associations are as pregnant with disaster as is lack of confidence in the ability of the management. In fact such misconceptions often cause this lack of confidence because they anticipate impossible results. The management can go no further than it can lead the membership.

Marketing problems have become so complicated, and parts of the marketing mechanism are so far removed from the experience of the average farmer, that marketing is not generally well understood. The season's price is the only part which many feel capable of criticizing, consequently no matter what deficiencies may exist in the marketing mechanism some farmers may be satisfied to put up with them unless they regard prices as too low. There is a tendency, therefore, to judge the efficiency and effectiveness of a cooperative entirely by the prices obtained. Often there is no thought of actual market conditions, because the factors that influence or determine prices are not understood or appreciated.

With such limited knowledge, members are sometimes unable to know when their association is performing marketing service efficiently except by comparing prices obtained by the cooperative with those obtained by competing agencies. This may be an unfair method of comparison in the early years of cooperatives which have set out on a long-time program to improve marketing conditions in the commodity handled by them. The association's achievements may be much more valuable in the long run than the immediate price comparison would show.

Necessity of Membership Support

Such farmers take little interest in the details of operation of cooperatives, when they become members, because they have insufficient knowledge of the problems attending the development of new marketing methods and the part that members must play in adopting production practices that assist in the application of improved marketing methods.

Even the most efficient management of a cooperative must have the support and cooperation of the membership. This support involves interest based on knowledge of the marketing mechanism, of factors influencing prices, of some of the more important principles

of merchandising, and of the affairs of the organization. The membership problem is one of education and information on marketing and on the possibilities and limitations of cooperative associations.

Hence, fundamental economic principles of marketing should be translated into the language of farmer experience, so that knowledge of these principles may become general. Methods of getting information to members regarding the problems and progress of the organization—the real facts of its achievements in rendering marketing service and the problems for solution—must be evolved. In other words, the membership problem seems to be to teach the member. The problems growing out of membership relations will be solved as facts regarding the actual thinking and attitudes of the members are accumulated and as successful methods of teaching the members, and of leading them, are developed.

JAMES W. JONES.

COOPERATIVES Growing in Membership and Scope of Operations There are many thousands of agricultural associations in the United States. They are of many kinds, formed for different purposes, and functioning in a variety of ways. Roughly, they may be grouped as educational organizations, improvement associations, and cooperative business enterprises.

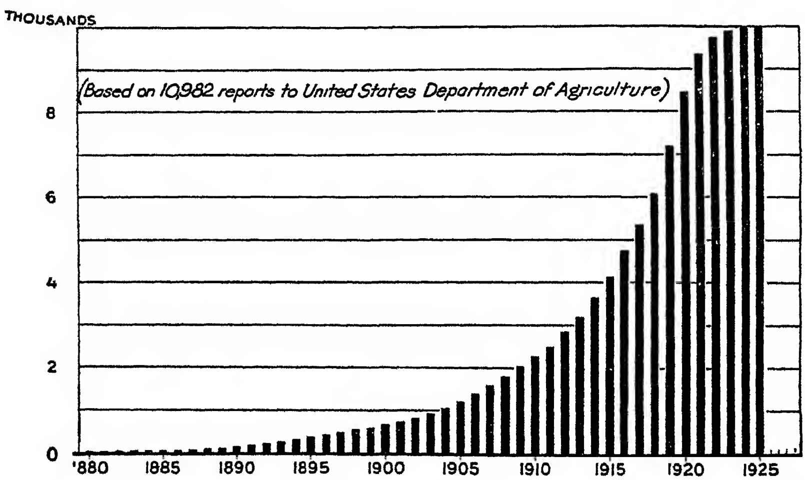

FIG. 49.—Cooperative marketing and purchasing associations have been increasing in numbers for many years. The growth from 1910 to 1921 was rapid Since 1921 it has been less marked

Since about 1898 the United States Department of Agriculture has been collecting information relative to the number of cooperative marketing and purchasing associations, their methods of operation, and the degree of success attained. The number of associations increased rapidly from 1904 to 1920. (Fig. 49.) Since 1920 the cooperative movement has been characterized by the creation of large-scale organizations and by the consolidation of existing organizations into larger units. During the period 1920 to 1925 wheat pools were formed in Washington, Oregon, Idaho, Montana, Colo-

rado, Oklahoma, Texas, Kansas, Nebraska, the Dakotas, Minnesota, and Indiana; cotton associations were set up in 12 of the Southern States; tobacco growers' associations were organized in Virginia, the Carolinas, Kentucky, Ohio, Connecticut, and Wisconsin; peanut associations were formed in Virginia and Georgia; rice associations in Arkansas and Louisiana; a broomcorn association in Oklahoma; maple products associations in New York and Vermont; potato associations in Maine and Minnesota. During the same period local associations were formed in many of the States. In five years over 800,000 producers, largely without experience in cooperative enterprises, were enrolled in the new organizations.

Pooling of Interests

In addition to the formation of many new associations, existing associations in increasing numbers pooled their interests. Cooperative creameries in Minnesota federated and began to develop a merchandising program, livestock shipping associations turned to cooperative sales agencies in the terminal livestock markets, various attempts were made in the terminal grain markets to establish cooperative sales agencies, and federations of associations of egg producers were formed for the merchandising of eggs and poultry.

Cooperative associations to the number of 10,803 were listed by the Division of Cooperative Marketing of the Department of Agriculture at the close of 1925. Nearly three-fourths of these associations were in the 12 North Central States. About 6 per cent of all the associations were in the Pacific States. Thirty-one per cent of the total number of associations were engaged in handling grain; 20 per cent, dairy products; 16 per cent, livestock; and 11 per cent, fruits and vegetables.

The 10,803 associations had an estimated membership of 2,700,000 representing 1,800,000 individuals. It is estimated that they transacted business to the amount of $2,400,000,000 in 1925. Thirty-one per cent of this business was handled by the grain associations, 22 per cent by the organizations handling dairy products, 13 per cent by the livestock shipping associations, 12 per cent by the fruit and vegetable associations, and 6 per cent by the associations marketing cotton.

Among the associations which were active at the close of 1925 were 3,338 engaged in the marketing of grains, 2,197 handling dairy products, 1,770 shipping livestock, 1,237 marketing fruits and vegetables, and smaller numbers handling other commodities.

Formerly the greater part of the cooperative buying by farmers was done through the local cooperative associations. But the tendency at present is toward buying through large-scale associations with sufficient capital to purchase supplies by the train load and even to operate factories for the manufacture of feeds, fertilizers, etc. One large association is serving the New England farmers, another serves New York and Pennsylvania farmers, and others are buying for farmers in Maryland, Ohio, Indiana, Michigan, Iowa, and Nebraska. Minnesota creameries are buying supplies largely through a single cooperative purchasing agency as are also the citrus growers of California and the apple growers of Oregon.

R. H. Elsworth.

COOPERATIVES Handling Milk Endeavor to Regulate Production Control of the production of agricultural commodities is recognized as much more difficult than that of industrial commodities. Little attempt has been made, as yet, to accomplish this for agriculture. The producers of milk for fluid consumption are among the pioneers in this field. Some large cooperative milk-marketing associations have been able to effect a higher degree of production control than was thought possible.

Formerly most fluid milk was sold on a flat-price basis. The dealer paid one price for all milk regardless of what use he made of it. To the farmer it seemed the most satisfactory method, for he knew the price he was to receive before he delivered his milk, and could make comparisons between dealers. The dealer preferred it because open price cutting was prevented and because he did not need to disclose the quantity that could be sold for fluid consumption. The fact of a large surplus could always be held up to prevent producers from asking an increase in price. The dealer took the risk of marketing whatever quantity was produced but rewarded himself adequately therefor.

When the producers began to market their own milk cooperatively they believed they could receive more nearly what the market afforded if they assumed most of the risk themselves. They have employed two general plans of production control. One is usually known as the basic rating or individual base plan; the other is known as the contract plan.

Production Control

Under the basic-rating plan a definite portion of the fluid milk market is assigned to each producer, based on the average monthly quantity of milk produced during some designated base period. The period chosen is designed to cover the time when production and the amount taken for fluid consumption are most nearly equal. This ordinarily occurs when production is at its lowest point. In some associations the last three months of the calendar year have been taken for the base period. The average monthly production for this three-month period in any year is taken as the basic quantity for the following nine months.

For a quantity of milk equal to the basic quantity the producer receives a price agreed upon from time to time between his association and the dealers who distribute the milk. For any excess quantity of milk the producer receives a lower price based on the prices of manufactured dairy products, principally butter. The producer whose production varies least will receive the highest price for his milk. If the producer can manage to establish the peak of his production during the basic period he receives no penalty for his lower production during the remainder of the year, but such action by a large number of the producers in a territory may tend to defeat the object of the plan.

Under the contract plan the producer contracts, at some stipulated date, to supply a given quantity of milk each month which he agrees to market through the association during the following year. If he

fails to deliver the contracted amount in any month he is paid for what he delivers and is penalized a given amount for each quart he fails to deliver. If he delivers a quantity larger than contracted, the association markets his whole production, but he is required to pay the same penalty per quart for his excess production as for his failure to produce the contracted supply.

A modification of the contract plan places the contracted milk in a pool. All milk delivered in excess of the quantity contracted is disposed of separately and sold at the best price obtainable after the sale of the pooled milk. Ordinarily it is sold for some manufacturing purpose at a lower price. If the aggregate of producers fail to produce the quantity of milk needed to supply the association's customers the organization buys such milk wherever it can be obtained. Any additional cost of this milk is prorated back, in accordance with any deficiency, to those producers who failed to furnish the amount for which they contracted.

Basic Rating Also a Price Plan

In the basic-rating plan prices for basic milk are agreed upon by the producers' organization and the dealers and are changed whenever the conditions of the market and anticipated future supply justify. The success of the plan requires that changes take place from time to time to keep the market in a healthy condition. Prices for the quantity produced in excess of the basic quantity are ordinarily based on butter prices, and are determined by formula. They fluctuate with butter prices, though not always directly, since the formula may call for a constant premium above butter prices.

Cooperative milk-marketing associations that employ the contract plan of production control, and others that make no attempt to control production, market their milk through what is usually known as the use or classification plan. Under this plan the dealer pays for the milk he purchases according to the use he makes of it. The simplest classification employs only two classes—fluid and surplus. For all milk sold for fluid consumption a higher price is paid than for milk sold for other uses. Some associations use a threefold classification—fluid milk, fluid cream, and milk for all other uses grouped together. Sometimes more elaborate classification of the various uses manufactured for products is employed.

The prices paid for milk for fluid consumption are always highest. The number of producers competing for this use is limited. The area that produces sweet cream for fluid consumption is considerably greater but is not so extended as that which produces milk for manufactured products. Wherever more than a twofold classification is used, the price of milk for sweet cream for table use is next to that of fluid milk. Producers of milk for manufacturing purposes must compete on a country-wide or world-wide basis and with a product often inferior in quality.

HUTZEL METZGER.

CORN BORER Control Adds to Farm Costs But is Worth While Enormous damage done by the European corn borer in Canada and its continued spread and increased infestation in the United States in the last few years have impressed farmers and agricultural organizations with the necessity of controlling this pest if the Corn Belt is to be spared from reductions in corn yields and acreages similar to those suffered in the corn areas of Canada. Efforts made during 1927 to reduce the danger of damage by the corn borer have involved a number of changes in farm practices in the infested area and have increased considerably the amount of labor required, especially in preparing land for crops that follow corn.

The destruction of corn borers before they emerge from their winter quarters in cornstalks and coarse-stemmed weeds or other plants is best accomplished by burning, shredding finely, cutting for silage, or carefully plowing under the cornstalks or other material in which they hibernate. The choice of control methods used depends upon the acreage of corn grown per farm, the method of harvesting corn, the kind and number of livestock kept, tillage methods, and other factors.

There is a wide variation in corn-harvesting methods, in corn acreage per farm, and in methods of tillage in different districts of the Corn Belt. According to a study made in the summer of 1927 of the methods and cost of cleaning cornfields on account of the corn borer in parts of Ohio and Michigan the average acreage of corn per farm varied from 8 acres in Ashtabula County, Ohio, to 61 acres per farm in Paulding County of the same State. The proportion of corn cut for silage, for shredding, or to be fed as shock corn varied from 2 per cent in Paulding County, Ohio, to 98 per cent in St. Clair County, Mich. In Paulding County, Ohio, none of the farms visited had silos and in Livingston County, Mich., 60 per cent of the farms were equipped with silos.

The amount of extra labor used in cleaning up cornfields and the actual operations performed depend largely on the usual method of preparing cornland for small grain, on the method of harvesting corn, and on how nearly a perfect clean-up is attained. Only about one-half of the cornland on the farms visited in northern Ohio and southeastern Michigan is ordinarily plowed in preparation for the following crop. In northwestern and north-central Ohio, more than two-thirds of the cornland sown to spring grains is ordinarily disked instead of being plowed before seeding.

Clean-Up Difficulties in 1927

The 1927 corn-borer clean-up was accomplished under greater difficulties than would be the case under more nearly normal conditions. The clean-up program was not announced until early spring, and with the very unfavorable weather conditions that prevailed farmers were hard pressed to find time to perform any extra operations. Furthermore, many farmers did not know the most economical methods of cleaning cornfields satisfactorily. With the experience of 1927 as a guide and with a whole year in which to plan farm operations so that more work can be done in the fall it should be easier to perform clean-up work in the future than it was in 1927.

In the districts where a large proportion of the corn ground was plowed on account of the corn borer the amount of man labor used in the preparation of ground for the crop following corn was usually more than double the normal amount used. In north-central Ohio almost one-half of the cornland on the farms visited was plowed especially to dispose of cornstalks, weeds, and trash more effectively. For such localities, where disking is the usual practice and plowing is an extra operation, the normal and extra labor requirements per acre in preparing cornland for spring grain are about as shown in Table 1.

TABLE 1.—*Normal and extra labor requirements per acre for preparing corn land for spring grain*

Normal operations	Hours per acre			Operations under control methods	Hours per acre		
	Man	Horse	Tractor		Man	Horse	Tractor
Double disk twice	1.4		1.4	Break stubble	0.8	1.6	
Drag	.6	1.8		Plow	2.0		2.
Roll	.8	1.6		Double disk twice	1.4		1
				Drag	.6	1.8	
				Roll twice	1.6	3.2	
				Hand pick	2.0	1.0	
Total	2.8	3.4	1.4	Total	8.4	7.6	3.
				Additional labor	5.6	4.2	2.

Where soil conditions are such that disking in spring grain is the usual practice it often takes just as much disking, and perhaps a little more dragging or rolling, after plowing than if the ground had not been plowed at all.

Methods Where Corn Has Been Cut in Fall

Where corn has been cut in the fall, corn-borer-control methods include breaking off or rolling down the stubble, plowing more carefully with the use of jointers and wires or chains, and picking up by hand any remnants that were not entirely covered in plowing or that were uncovered in subsequent tillage operations. The substitution of the disk and spike-tooth drag for the spring-tooth harrow in districts where the latter is used extensively reduces the amount of hand picking necessary because fewer stalks and weeds are brought to the surface while working down the seed bed. Cutting the corn as low as practicable in the fall also reduces the amount of hand labor necessary to clean up fields. Typical labor requirements for cleaning up cornfields where plowing for spring grains is the usual practice are shown in Table 2.

TABLE 2.—*Typical labor requirements for cleaning up corn land*

Normal operations	Hours per acre		Operations under control methods	Hours per acre	
	Man	Horse		Man	Horse
Plow	4.1	12.3	Break stubble	0.8	1.6
Spring-tooth harrow twice	1.8	5.4	Plow	4.5	13.5
Drag	.6	1.8	Double disk	1.4	4.2
Roll	.8	1.6	Drag twice	1.2	3.6
			Roll	.8	1.6
			Hand pick	2.0	1.0
Total	7.3	21.1	Total	10.7	25.5
			Additional labor	3.4	4.4

If plowing for spring grains is not ordinarily done, the use of a stubble beater makes plowing unnecessary where it can be used effectively. Its use is not satisfactory on rough or stony land or where the stubble are too long or the rows too close together. Stubble beaters should be used in the fall, if possible, because soil conditions are usually more favorable at that time. The heavy tractors necessary to furnish sufficient power to operate them and the narrow wheels on the beater cause considerable packing of the soil, especially when the soil is wet.

Careful Plowing Imperative

Where corn has been husked or snapped from the standing stalk, clean-up operations include breaking off the stalks, raking twice and burning, using wires or chains in plowing, and the gathering by hand of any material on top of the ground that might harbor corn borers. Careful plowing is probably even more important than where the corn has been cut. The most important means of getting rid of cornstalks is to do a good job of raking and burning. Special cornstalk rakes with the teeth set close together are more effective than the ordinary dump rake. Some men have been able to plow under practically all of the cornstalks even when they have not been carefully burned. The stalks are much more liable to cause trouble later, however, by being brought to the surface in harrowing or cultivating. Typical normal and extra labor and power requirements for preparing land for spring grains where the corn has been husked from the standing stalks and where disking in spring grain is the usual practice are as shown in Table 3.

TABLE 3.—*Labor and power requirements for preparing cornland for spring grains*

Normal operations	Hours per acre		Operations under control methods	Hours per acre	
	Man	Horse		Man	Horse
Break stalks	0.6	1.2	Break stalks twice	1.2	2.4
Rake stalks	.7	1.4	Rake stalks twice	1.6	3.2
Burn stalks	.2		Burn stalks	.5	
Double disk twice	2.8	8.4	Plow	4.5	13.5
Drag	.6	1.8	Double disk twice	2.8	8.4
Roll	.8	1.6	Drag	.6	1.8
			Roll	.8	1.6
			Hand pick	2.0	1.0
Total	5.7	14.4	Total	14.0	31.9
			Additional labor	8.3	17.5

The total extra labor per acre on 732 farms in 12 localities in northern Ohio and southeastern Michigan averaged 5.3 man-hours, 3.9 horse-hours and 0.4 tractor-hours. This is equivalent to from 13 to 17 eight-hour days per farm on farms growing 20 to 25 acres of corn. In some districts there was an average of as low as 5 days extra labor per farm and in Lucas County, Ohio, there were 32 days of extra labor per farm. Most of the extra labor in all of the districts was done by the operator, his family, or regular hired labor. In some counties practically no extra labor was hired on account of the extra work.

The variation in the completeness of the clean-up in different districts is probably reflected to some extent in the variation in the percentage of the corn acreage that was hand picked. In one district where borer infestation was very light and the corn acreage per farm quite large, only 23 per cent of the corn acreage was picked over by hand. More effective clean-up methods should probably reduce the amount of time spent per acre in picking up stalks and stubble.

GEORGE W. COLLIER.

CORN BORER Control Effort in $10,000,000 Program Checks Pest When, on February 23, 1927, the Sixty-ninth Congress of the United States appropriated $10,000,000 for the "eradication or control of the European corn borer," there was assigned primarily to the Bureau of Entomology of the Department of Agriculture what undoubtedly was the largest insect-control project ever undertaken in the history of the world. The events which precipitated this unprecedented action were the almost entire destruction of the corn crop by the pest in southeastern Ontario, Canada, the invasion of nearly one-half of Ohio and Michigan, and the encroachment of this insect into the northeastern corner of Indiana. (Fig. 50.)

Although the corn borer had been present in northern Ohio for five years, and the department, in cooperation with the affected States, had made every effort toward informing everyone concerned of the impending danger, public consciousness of the situation failed to awaken until the fall of 1926, when the bankers, agriculturists, and business men of the Middle West suddenly realized, through the decline in the value of farm lands in the infested areas and the reports of crop experts, that a serious menace was actually hammering at the doors of the Corn Belt. The circumstances of the situation obviously were such as to demand prompt and decisive steps to repress the pest if the Corn Belt was to avoid immediate invasion by it.

The somewhat belated consciousness of this grave condition was responsible for the immediate organization of a committee of corn growers, agriculturists, business men, and scientists, who after due deliberation decided that in order to cope with the existing emergency a Federal appropriation in the amount of $10,000,000 would be required. This proposal received the approval of the President and the Secretary of Agriculture, and the appropriation was made. While it was conceded by all the scientists conversant with the situation that extermination of the corn borer was impossible and the entomologists of the department frankly stated that they regarded the project simply as a large-scale experiment in control, it was felt that in view of the serious menace to the corn culture of the country presented by the situation the project was well worth a trial.

The Plan of Action

The general plan of action adopted in the work provided that the corn growers in the most heavily infested areas in New York, Pennsylvania, Ohio, Michigan, and Indiana were to be required to clean up all corn débris of the previous crop then existing on their premises and that they should be reimbursed for "such of this work as was

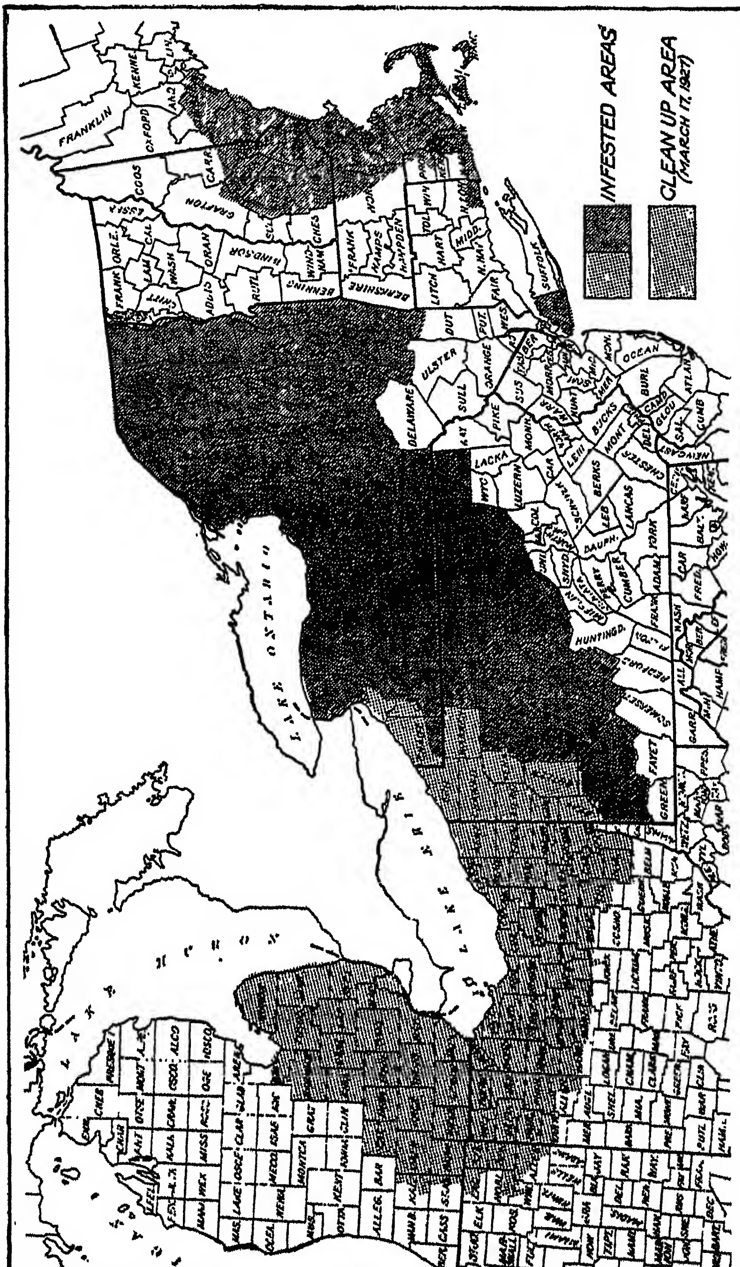

FIG. 50.—Map showing area infested by the European corn borer at the beginning of the clean-up campaign. The limits of this area are also indicated

additional to that which is normal and usual in ordinary farm operations" but not to exceed $2 per acre, subject to the approval of a Federal inspector.

Although the Federal appropriation for this great project became available February 23, 1927, the legal advisors of the department found that, owing to the character of the work to be undertaken, it was then necessary to secure enabling legislation by the several States involved before the project could be started, because in all cases it was necessary to enforce the regulatory work under State authority. For this reason the project could not be actually started until March 14, when the first equipment was purchased and operations were begun.

It was evident from the first that this enormous project was too much of an undertaking for the resources of a single bureau and that, if success were to be achieved, there must be coordination of all the resources of the department. This end was achieved through A. F. Woods, director of scientific work, with W. H. Larrimer, senior entomologist in charge of the Division of Cereal and Forage Insects of the Bureau of Entomology, in direct charge of the administration of the work. Among the branches of the department which made most important contributions to the success of the work were the extension service, the office of disbursements and accounts, the office of business administration, the office of purchase and sales, the Bureau of Public Roads, and the office of information. Both the Post Office Department and the Government Printing Office also contributed essential and hearty cooperation in facilitating the circulation of publications vital to the success of the work.

A most efficient field organization was rapidly assembled by L. H. Worthley, administrative officer in charge of control work, who established general headquarters near the center of operations at Toledo, Ohio. Here was delivered and assembled all of the vast quantity of machinery required in attacking the foe. This included such items as 800 auto trucks, 1,200 or more tractors, 800 stubble beaters, and comparable numbers of similar machines sufficient to treat the extensive area which it was believed would require such action. By the last of March all of these devices were in hand and demonstrations of the methods of using them were under way.

Hearty Response from Farmers

All corn growers in the clean-up area were notified that they would have until May 1 to clean their premises subject to approval of a Federal inspector, but that after such date the State and Federal forces would finish the task where necessary. Owing to the inclement weather and backward spring, it was later decided to extend this date until May 16. The response of the farmers to this announcement was so general and hearty as to seem almost miraculous. Their activities in destroying infested corn remnants at once became visible in "columns of smoke by day and pillars of fire by night." (Fig. 51.) Entire families, including old men, women, and even little children, were to be observed in many sections of the area gathering by hand and otherwise almost every vestige of corn débris from the surface of the soil. Then it began to rain, and it rained with most discouraging persistence all through the month of April.

Nevertheless, in spite of mud, discomfort, and exposure, effective work was accomplished.

Throughout great areas in the most heavily infested region, where ordinarily thousands of acres of standing stalks were to be observed, hardly a field of such dangerous material remained. In some localities, however, the task, as was foreseen, had proved too great for the existing resources of the farmers, and at the appointed time the State and Federal forces began the final offensive against the foe. Although it continued to rain most dismally, the campaign proceeded. Standing stalks and stubble were plowed cleanly under, and on land which was already in small grain but where much débris remained stubble beaters were operated or the remnants were gathered by hand. Vast areas were raked and burned, and as a last resort wet or muddy fields were burned over by the use of especially designed burners supplied with fuel oil under high pressure from powerful motorized pumps. July 2 saw the completion of these operations, when this vast campaign, conducted in cooperation with all the State forces and more than 300,000 farmers, came to an end.

FIG. 51 —Burning is the most effective method in control of the European corn borer

The Federal regulations under which this work was done provided that compensation was to be paid the farmers for extra labor performed by them as part of the clean-up campaign; such extra labor was interpreted to mean "such work as is additional to that which is normal and usual in ordinary farm operations." The rate paid for this extra labor was not to exceed $2 per acre for cornland that was cleaned up in a manner successfully to pass final inspection.

$4,200,000 Paid to Corn Growers

At this writing the sum of $4,200,000 has been paid to the corn growers for their part in this fight, and doubtless every outstanding claim will be settled within the very near future. Careful estimates based on actual field counts taken by trained investigators at the conclusion of the campaign indicate that in the areas actually cleaned up an average destruction of 95 per cent of the borers was obtained. This result was far better than had been expected by the most optimistic in view of the late date at which the campaign had to be started and the almost disheartening handicaps presented by the rainy season and consequent conditions of the fields.

As the summer of 1927 progressed and the results of the annual survey to determine the limits of the corn-borer infestation in the lake region began to be known, it became apparent that much newly

infested territory was being found, especially in Ohio. These newly found infestations, however, lay entirely outside of the cleaned-up area and may well have resulted from infestations of the insect which it was impossible to find during the scouting season of 1926. It may sound discouraging to the uninitiated to state that even by the use of the most efficient and extensive corps of trained scouts we can never hope to learn the exact, ultimate limits of spread of the corn borer at a given time, but this is the literal truth. To achieve such a result, it would be necessary to examine each stalk in every cornfield in all regions, however remote, that could be suspected of containing the borer. In addition to this it would be necessary to split from end to end each stalk examined, thus entailing the destruction of the crop. The end to be attained obviously would in no way justify such radical and drastic procedure.

The concrete or visible results of the great clean-up campaign, based on complete surveys, have recently been announced. The annual critical survey which is made to determine the existing rate of infestation showed at the end of 1926 that there were nearly four times as many borers present in the infested area in which the projected clean-up campaign was to be conducted than were present in the fall of 1925. The average number of borers then contained in each 100 stalks was estimated as 9. At the close of 1927 it was found that this number had increased to 14 borers per 100 stalks, which represents an increase of less than twofold.

Potential Rate of Increase

The results of nearly nine years' research work on the borer have shown that the average potential rate of increase for the borer is approximately thirtyfold. This means, for instance, that where five borers are left alive in a field they may multiply to 150 borers in a single season. That a marked decrease not only in this potential rate of increase but also in the actual rate that had prevailed in previous years has occurred was unmistakably indicated by the results of the 1927 survey previously referred to. The effect of the clean-up at the end of 1927 may be indicated for the various States as follows: In Michigan the rate of increase was slightly less than threefold; in Pennsylvania slightly more than fourfold; in New York there was found an actual decrease in the number of borers present in the clean-up area as compared with 1926 to the amount of 20 per cent, while in Ohio there was also recorded a very slight decrease amounting to about 5 per cent of the borer population. That these favorable results were not due to influences other than the clean-up work is indicated by the fact that observations made by skilled workers showed that the rate of establishment for the young borers in 1927 was unusually high. It is also known that the extremely moist conditions that prevailed throughout the clean-up area in April and May, 1927, were especially favorable to the development of the nearly mature corn-borer larvæ.

Few persons save those trained in the natural sciences have any conception of the enormous potential power of multiplication possessed by insects in general. Were it not for the high rates of natural and induced mortality which normally prevail among insects, they would very soon smother out by sheer weight of their bodies all other forms of animal life on the globe, including man. It has been shown,

for instance, that were it not for the controlling influences previously mentioned the progeny of a single plant louse would in the brief period of three months amount to more than 731 billions of individuals.

Campaign a Substantial Success

Fortunately in the case of the corn borer even the theoretical rate of increase is much lower than this, or about thirtyfold, as has been previously stated. It has been shown, however, that there was an actual decrease in the rate of increase of the pest in Ohio and New York, and that even in the other States an increase in infestation of much less than thirtyfold occurred. In point of fact the rate of increase has been so greatly lowered as to indicate the substantial success of the campaign everywhere. This view of the matter is taken by the International Corn Borer Organization, a nonofficial and disinterested body, in the report of its executive committee, made at Detroit, Mich., September 23, 1927. This report says:

> After due consideration of the data presented and after observing conditions, it is the judgment of the committee that the campaign has been successful and has accomplished, as far as is humanly possible, the object set out to accomplish.

A joint committee of scientists, consisting of a committee from the American Association of Economic Entomologists, the American Society of Agronomy, and the American Society of Engineers, meeting also at Detroit on the same day, presented their report containing the following statement:

> The committee of entomologists, agronomists, and agricultural engineers cooperating wishes to indorse and to give its hearty approval to the efforts that have been made to control the corn borer and to commend those engaged in directing the research, regulatory, and extension activities designed for its control. Especial commendation is given to the farmers who cooperated so splendidly in the clean-up campaign. It is believed that the compulsory clean-up of 1927 not only greatly reduced the rate of infestation increase, but has been successful in preventing serious commercial losses, and that the expenditure of large funds for this purpose has been completely justified.

W. R. Walton.

CORN BORER Makes Changes Necessary in Farm Methods

New insect pests or diseases, like new machines, new crops, or new and important varieties of crops, are always accompanied by some adjustments, either in production practices, in the enterprises included in the business, or in the extent of the various enterprises. To date the areas of commercial damage by the corn borer in Ohio and Michigan are limited to a few localities near Lake Erie and Lake St. Clair. Nevertheless, the great damage caused by this insect in the corn area of Ontario, its continued spread in the United States during the past six years, and the potential danger to the Corn Belt make imperative the adoption of farm practices designed to keep the infestation at a minimum point. These control practices, which are described elsewhere in this yearbook, involve the use of additional labor and power in corn production or in the preparation of cornland for subsequent crops.

Thus, while the actual damage due to the corn borer has not been sufficient to affect appreciably the selection of farm enterprises

in the infested area, the extra labor involved in the adoption of necessary control practices has in many cases been important enough to cause farmers to make some changes in their systems of crop and livestock production. In considering or making such changes the following questions are particularly important: (1) What other crops may be substituted profitably for corn as cash crops or as feed crops? (2) What changes in the methods of utilizing corn stover or fodder are desirable? Should the use of silage and shredded stover be increased? Should such practices as "hogging down" corn or pasturing stalk ground be continued? (3) What roughages may be grown for feed instead of silage, stover, or shredded stover? (4) What methods of feeding livestock are most economical and profitable under the new conditions surrounding corn production? (5) What changes in the kind of livestock produced are made necessary by the new conditions?

Many Factors Involved

In answering these questions many factors have to be considered. In northeastern Ohio the acreages of corn per farm are small, most of it is cut, and a large portion of it is shredded or put into the silo. In that area these questions are less serious than in those sections where most of the stalks remain to be disposed of, either in the fields or scattered over the feed lot. The low cutting of corn and the greater use of silage and shredded stover on farms where the acreage of corn and numbers of livestock are sufficient to justify these practices will obviate the necessity of much of the extra clean-up labor performed in northeastern Ohio in the spring of 1927.

Where corn is grown primarily for sale, as in some sections of northwestern Ohio, the relative values per acre of corn and alternative crops, after actual cash expenses are paid, are an important consideration. The comparison of values per acre of corn, wheat, barley, oats, and sugar beets, based upon average yields and average prices in Paulding County, Ohio, as shown in Table 4, indicates the superiority of corn over the small-grain crops as a per-acre revenue producer:[2]

TABLE 4.—*Values of corn and other crops compared*

	Average yield per acre	Value per acre above actual cash costs [1]
	Bushels	*Dollars*
Corn	40	27.81
Wheat	17	16.87
Barley	25	14.39
Oats	35	11.08
	Tons	
Sugar beets	8	31.39

[1] Cash costs for seed, twine, threshing, special hired labor, and contract labor for sugar beets deducted from gross values per acre.

More labor is ordinarily used in the production of corn than for small-grain crops, but the labor on corn is distributed more evenly throughout the year.

[2] Data from study made in cooperation with the Ohio Agricultural Experiment Station.

A Shift to Sugar Beets

Sugar beets compare more favorably with corn as a revenue producer than any other crop now commonly grown in northwestern Ohio. A study of several hundred farms in that section of the State indicated a slight tendency for farmers to shift a part of their acreage from corn to sugar beets. Sugar beets fit well in the usual crop rotation in this area, since they are a cultivated crop and the labor demands are more similar to those of corn than is the case with any of the small grains. Land not suited to sugar-beet production, lack of marketing facilities, and the expense of hauling beets to the factory or shipping station are often limiting factors. In addition, the labor problems involved in sugar-beet production are more serious than in the case of corn or small-grain crops.

From the standpoint of feed produced per acre the small-grain crops again fail to compare favorably with corn in northern Ohio and southeastern Michigan. This, together with the above facts for one locality, indicates the difficulty of finding readily a profitable substitute for corn. Moreover, a large proportion of the farms in this area are adjusted to corn production as an important or primary enterprise either as a primary source of feed for livestock or as the important cultivated crop in the rotation. The size of farms is in some sections adjusted to the acreage of corn which can be grown effectively with a given labor supply or with certain equipment for cultivating or harvesting. In such cases substantial changes in corn acreage may involve corresponding adjustments in the size of farms. Changes of this type usually come about slowly. They should await developments with respect to commercial damage by the borer and the effectiveness of control practices which may be incorporated with present production practices without adding materially to the actual cash expense of farm operation.

Changes on Larger Farms

In a series of farm-management studies in the infested areas in 1927 the most pronounced shifts in corn acreage were found on the larger farms in Lenawee County, Mich., and Lucas County, Ohio, and on those farms not having silos in the territory adjacent to Lake St. Clair. The shifts on the larger farms resulted primarily from the difficulty of cleaning up large acreages of cornland by the methods used in 1927. In St. Clair County, Mich., and in Lucas County, Ohio, the present and prospective damage to corn was also a factor in acreage reduction. In these areas the acreages of wheat, oats, barley, alfalfa, mixed hay, and sugar beets were each increased slightly and the acreage of corn reduced. Most of these shifts were no doubt of a temporary character and were influenced to some extent by the unusual conditions existing in the spring of 1927.

Adjustments in farm organization of a more permanent character can not be made until the effectiveness and cost under farm conditions of various control practices in keeping down infestation are more definitely determined. Such adjustments will be most marked in those areas where the advantage in corn growing as compared with the growing of alternative crops is least. If mechanical methods of control continue to be the most important methods

employed, those areas not adapted to the extensive use of machinery because of topography, stony land, small fields, or other factors will no doubt be most affected.

JESSE W. TAPP.

CORN SEED Treatment of Dent Varieties in Commercial Practice In those parts of the Corn Belt where the seedling-blight diseases may seriously reduce stands and yields of corn, the judicious use of seed treatment is commercially feasible and profitable. Different lots of seed corn vary greatly in vitality and quality. One grower's seed may be practically perfect in vitality and carry no trace of the seedling-blight diseases, while a near-by grower's seed, although good in vitality, may carry a high percentage of seedling-blight infection which will seriously reduce the stand obtained from this seed when planted. Seed treatment, in the first case, probably would not result in any increase in yield, but on the diseased-seed lot seed treatment might be used with considerable profit.

Even the best seed lots of some widely grown and high-yielding commercial strains frequently carry an appreciable amount of seedling-blight infection which could be controlled satisfactorily by seed treatment. The seedling-blight diseases are particularly serious in a cool soil, and such seed when planted early is very likely to result in poor stands. Early planting is desirable to obtain the largest possible yields of well-matured corn. The use of seed treatment makes possible an earlier planting with reasonable assurance that replanting will not be necessary. When early planting is followed by a period of unfavorable weather, seed treatment frequently results in a moderate increase in yield, even where good seed has been used.

Compounds for Treating Seed

Much progress has been made during the last few years in developing compounds suitable for treating seed. Several compounds are available which are effective in killing the disease-producing organisms carried on the seed, but many of them cause injury to the good seed greater than the benefit to the diseased seed. The problem has been to find an economical seed treatment which would give the maximum increase in yield by controlling the seedling-blight diseases, insure more satisfactory field stands following early planting, and at the same time result in no decrease in yield when used on the best seed. (Fig. 52.) Some of the organic mercury-dust disinfectants now on the market meet these requirements in a fairly satisfactory way and are more convenient than the similar liquid treatments.

The seed is treated by applying the disinfectant dust to the surface of the kernels. Approximately 2 ounces of dust are required to treat 1 bushel of seed corn. Seed may be treated conveniently on the farm by mixing the seed and the dust in a barrel churn, a carbide can, an old milk can, or in a barrel mounted on a suitable frame as in treating seed wheat for stinking smut. Any excess dust should be screened off before the seed is planted. The accuracy of the rate of drop from the corn planter with treated seed also should be determined so as to insure planting at the desired rate. Sometimes it is necessary to use a different plate with treated seed.

FIG 52 Comparison of corn grown from disease-infected seed on adjacent plots with similar culture A, seed untreated, B, seed treated with an organic mercury-dust disinfectant

Practice of Seed Companies

During the last year a number of commercial seed companies and a few community organizations have introduced the practice of treating seed for their customers or members where seed treatment is desired. Approximately 50,000 acres were planted with treated seed in one county in Illinois in 1927.

Corn-seed treatments can not be expected to take the place of good seed selection, proper storage, and constructive breeding. Nor can they take the place of an accurately conducted germination test in selecting seed of superior vigor. Seed treatment will not always be followed by an increase in yield. Many strains and selections of corn are not benefited by the use of the dust disinfectants now commercially available. When better dust disinfectants are developed and when the limitations and advantages of seed treatments are better understood, it is possible that they may find a definite place in profitable corn production.

J. R. HOLBERT.

CORNSTALK Testing by Chemicals Indicates Food Needs of Plant

High yields of corn are dependent upon all or a majority of the plants in a field remaining healthy during the entire growing season and upon each plant producing well-developed and matured ears. Abundant soil fertility is required. The strain of corn must be adapted to the soil and local climatic conditions.

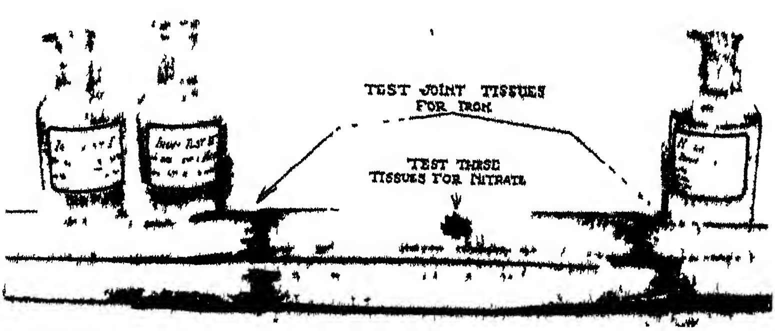

FIG. 53.—The tests for nitrate and iron are made on the internodal and joint (nodal) tissues, respectively, as shown in this figure

When, however, the attempt is made to grow corn in soils in which one or more of the necessary plant foods is lacking, the plants will show certain signs of starvation or malnutrition. It is possible to recognize these symptoms and to confirm the diagnosis of those troubles by making tests of the tissues of the affected stalks and of the soil in which they are growing with solutions of different chemicals (fig. 53).

The plant foods which are deficient most frequently in fields in the Corn Belt are nitrogen, potassium, or phosphorus salts. Very often more than one of these plant foods may be lacking in the same soil. The methods of recognizing the symptoms displayed by the plants growing under such soil conditions will be described briefly.

Nitrogen Relations

Corn plants growing under soil conditions of nitrogen starvation display a yellowish green to yellow color of the leaves and stalks. By splitting open cornstalks, as shown in Figure 54, and applying to the tissues a few drops of a solution of diphenylamine in concentrated sulphuric acid the presence of reserve nitrates in these tissues is indicated by the production of a blue color. The absence of any reserve nitrates is indicated by no color being produced. The yellowish-green leaves and no color reaction with the diphenylamine solution indicate that a deficiency of nitrogen exists. Such a condition is found frequently in sandy soils, in poorly drained soils, and in soils in regions of heavy rainfall. The further growth and development of the plants under such conditions is limited by the supply of nitrogen.

FIG. 54 The stalks selected for testing should represent a majority in the field. They should bear ears well along in maturity

The presence of reserve nitrates in the plants at any stage of development shows that nitrogen is not a limiting element for growth. Any yellowish green color of the leaves of plants carrying nitrate reserve then must be due to causes other than a deficiency of nitrogen. Occasionally, yellowish colored leaves are found on plants with reserve nitrates. This symptom is associated most often with soil conditions characterized by a low availability of potassium salts.

Potassium Relations

Plants growing under field conditions of low availability of potassium salts are characterized by a type of marginal leaf firing and by a decided tendency of the plants to die prematurely and to produce chaffy, starchy ears. The stalks of potassium-starved plants are weak. In addition, upon splitting the stalks open the joint tissues

will show abnormal discolorations due to the presence of accumulated compounds of iron, as shown in Figure 55.

The iron compounds are detected by applying a few drops of a 10-per-cent solution of potassium thiocyanate in water to the joint tissue and then adding also a few drops of dilute (1 to 2) hydrochloric acid. If heavy deposits of iron are present in these tissues, the supply of potassium salts was inadequate during the time of iron accumulation.

The iron accumulations cause a disintegration of these joint tissues, the result of which is to disrupt the physiological activities of these tissues. The developing ears are affected. The roots are starved of necessary food materials. The plant as a whole is weakened. It becomes increasingly susceptible to invasion by many different kinds of fungi.

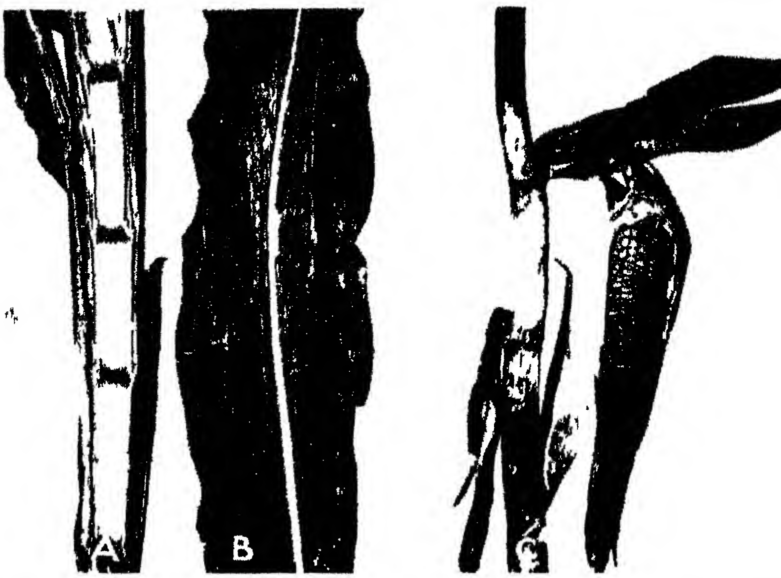

FIG. 55.—Effects of iron accumulation in the joint tissues and leaves of corn, symptoms of potassium starvation. A, nodal tissues; B, leaf tissues, C, shank tissues and ear development. Note that iron compounds weakened the shank tissues and prevented the ear from maturing. The leaf tissues were badly "fired" The joint tissues were discolored

The iron accumulations in the joints, accompanied by the leaf firing and chaffiness of the ears, serve to indicate a lack of sufficient available potassium salts in the soil. These potash-deficiency symptoms appear frequently in plants supplied abundantly with nitrogen and phosphorus salts.

Phosphorus Relations

Corn plants which are stunted in growth and which do not show the symptoms of either nitrogen or potassium starvation, already described, most often indicate a lack of available phosphorus. The stunted condition of the plants refers to a more or less uniform effect on the plants in a field or an area within the field.

There is no chemical test at present which can be made upon the plant tissues to confirm this symptom of phosphorus starvation, such as is possible with the nitrogen and potassium relations.

Phosphorus deficiencies exist most frequently in soils strongly acid in reaction. Consequently it is important to know whether or not the soil is acid when the stunted condition of the plants is found. Then, after determining the nitrogen and potassium relations, it is not difficult to diagnose the need for phosphorus. The higher the acidity of the soil, the greater is the probable need for available phosphates.

Plants starved of phosphorus may be dark green in color, due to the unused reserve nitrates in them. There may be accumulations of iron in the joint tissues if available potassium salts are lacking also.

Value of Stalk Tests

The stalk tests serve well to indicate the limiting plant foods for best growth and productivity of the corn plants. The stalk tests are qualitative only in character, but when used as a guide for the interpretation of the direction in which increased fertility should be established they are extremely valuable and practical.

The stalk tests are being used to check the results of many different experimental fertility plots throughout the country and have enhanced the value of such plots in many instances. The results of applying plant foods in unbalanced proportions in many of these plots are detected readily by the symptoms displayed by the plants and by means of the stalk tests. Hundreds of field demonstrations have established the practicability of the method.

GEORGE N. HOFFER

COTTON Communities Growing One Variety Only Are Increasing Many improvements of production are going forward in the cotton industry, but the outlook for substantial progress is much better in communities or districts where the growers are willing to cooperate, so that a combined effort can be made and continued for a period of years. A progressive individual farmer may struggle hard for a few seasons, only to be disappointed and discouraged in the end, for reasons that were overlooked at the beginning. Even if he obtains good seed and raises better crops than his neighbors, he still has little chance of selling his cotton for better prices. It is only in communities that are known to raise cotton of good quality that higher prices are paid.

Advantages of 2, 3, or 5 cents a pound in the price of cotton, or $10 to $25 a bale, may often determine whether the cotton has been raised at a profit or a loss to the farmer. Such advantages may be expected by farmers in one-variety communities above the prices obtained by growers of the same kind of cotton in communities that produce a miscellaneous crop. This is shown by experience in communities of California and other Southwestern States that have restricted themselves for several years to the growing of the Acala variety of cotton. The Acala is a superior variety obtained by the Department of Agriculture from Mexico, but its practical success has been due to the establishment of one-variety communities where the seed is kept pure and uniform fiber produced. The new system of community production is now being adopted in other parts of the Cotton Belt.

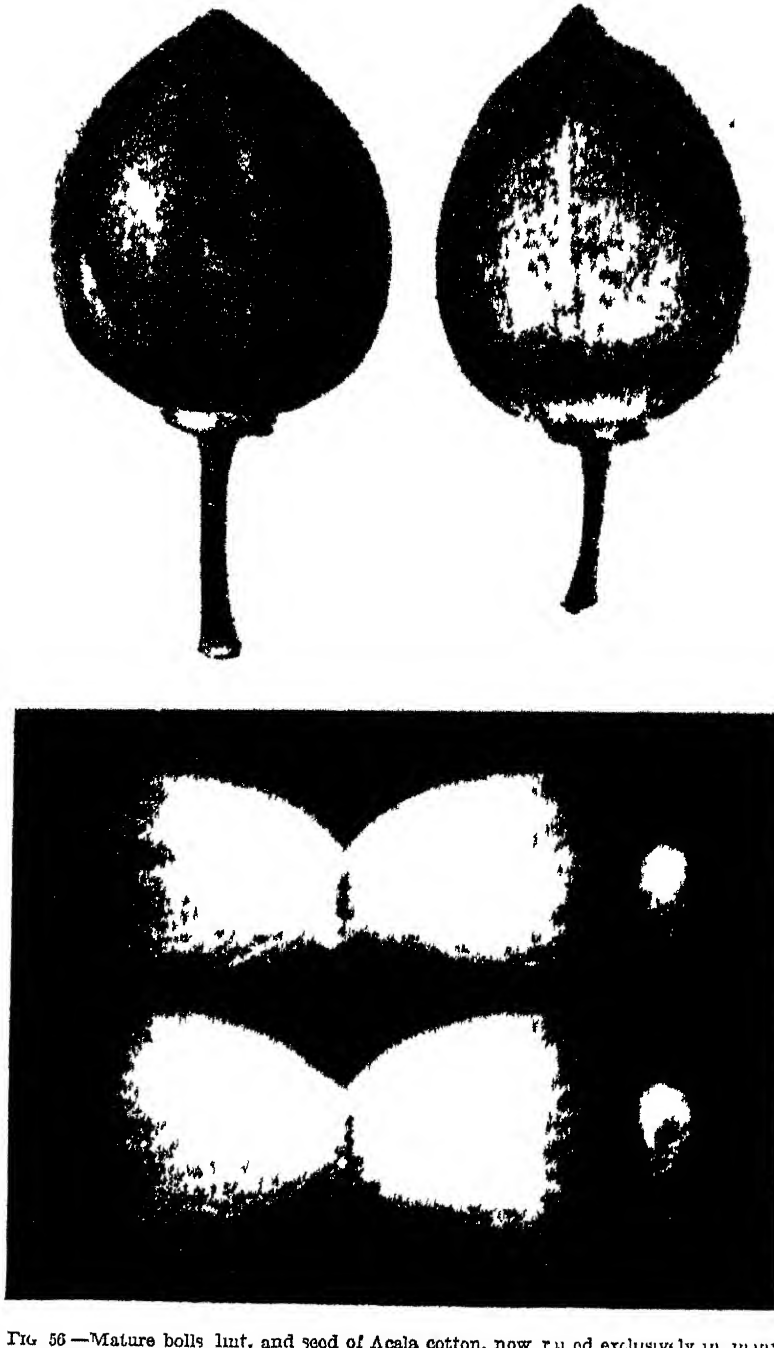

FIG. 56.—Mature bolls, lint, and seed of Acala cotton, now raised exclusively in many communities in California. The left-hand boll was grown in California, the right-hand boll in North Carolina. Note the even length of the lint fibers, not shortened toward the base of the seed as in many upland cottons. (Natural size)

Industrial Requirement Ignored

Though uniform cotton fiber was always wanted by the manufacturers, the general system of production was developed with no recognition of the industrial requirement. For lack of scientific study of the problems of production, the most elementary facts remained unrecognized. The manufacturers complained year after year of the deterioration that was going on in the quality of the fiber, but with no idea that the change might be connected with the establishment of the public gins that gradually replaced the old plantation gins in the period following the Civil War. No account was taken of the effect of mixing the seed of different varieties at the public gins, the planting of "gin-run" seed, or of the crossing and mongrelizing of the different kinds of plants in the fields.

Finally, after the problems of breeding superior varieties had been studied, the cause of the deterioration became clear. The effects of mixing and crossing are readily made visible by comparing the fiber of plants grown from select seed with the product of mixed gin-run seed, as shown in Figure 57. It is a mistake to suppose that commercial classing of the bales can bring about uniformity when the cotton in the fields is uneven. Uniformity is established by careful selection and isolation of the seed stocks, while mixing and crossing lead back to diversity and irregular fiber within a few seasons, even in the best varieties. With the recognition of the biological facts regarding the seed stocks, an effective way of avoiding the deterioration of varieties was discovered, a way that is so simple and advantageous that a good understanding of the problems is all that is needed to obtain general approval and adoption.

How to Avoid Mixing of Seed

The way to avoid the mixing of seed at the gins is to plant only one variety of cotton in each community or neighborhood, so that only one kind of cotton comes to the gin and only one kind of seed is planted. By this simple expedient of uniting on one variety, the farmers have it within their reach to produce cotton of higher and more uniform quality than the present crop and of more value to the spinner. The chief difficulties arise from the fact that cooperation among the growers is required to produce good cotton. This has not been recognized in the past, and many cotton growers are not easily accessible to the idea. But the system of community production has found entrance indirectly by way of the new cotton districts in California, Arizona, and New Mexico, where other forms of cooperation are highly developed and one-variety cotton communities have been maintained since 1920. Definite programs of community improvement have been adopted recently in several of the older cotton-growing States, including Texas, North Carolina, South Carolina, and Georgia.

The effect of adopting one variety is to give the farmers of a community a new interest in all of the cultural and marketing improvements that have been worked out, maintaining purebred seed, obtaining better yields and higher commercial grades, and finding the best markets for their standardized product. The need of careful ginning is appreciated, so that good fiber shall not be gin-cut or mixed with "trash," to the detriment of the grade. The

FIG. 57.—Effect of selection in cotton. Selected cotton at left, gin run at right. Uniformity is maintained by selection in one-variety communities, but is lost through mixing and crossing. The photograph shows uniform fiber on seeds from successive plants in a selected stock, compared with irregular fiber from successive plants in a mixed gin-run stock

ownership or control of the gin by the community is one of the forms of constructive cooperation that is now developing rapidly. Marketing is facilitated and prices are advanced because more buyers compete for the large uniform lots of good cotton. The sale of pure seed brings additional revenue to some communities. The one-variety community becomes a center of progress to an extent that is difficult to imagine for those who know only the older conditions of unorganized production.

Legislation in California

The advantages of community production have been so well appreciated that a special act was passed by the legislature of California in 1925 to give legal protection to communities where the farmers had restricted themselves to the growing of one variety of cotton. Several counties in California were established as pure-seed districts for the Acala variety of cotton, and the growing of any other was excluded. This legislation was based on the interest of the State and of the local community to permit the improvement of the cotton industry to the greatest extent through the planting of pure seed and the production of crops of the highest value. The effect of this legislation has been highly beneficial. All of the farmers of these communities have seed of the best quality to plant, and the fiber produced is of uniform, standardized quality that brings a premium on the market.

O. F. Cook.

COTTON Fabric Finish May Be Restored by Right Laundering During the past few years there has been a seeming decrease in the consumption of cotton for clothing and household textiles. This situation has come about in spite of the fact that cotton is cheaper than any other textile from which clothing is made, is cool for summer garments, and is readily and inexpensively kept clean. However, many women object to the loss of the crisp new appearance of most cottons during the laundering process. Satisfactory methods for restoring the original appearance to the laundered fabric would be of great assistance in bringing cotton into favor again.

The present methods used in the home to give a finish to laundered cottons generally prove rather unsuccessful. In the first place the same sizing ingredients are used for all weaves of cotton, heavy and fine, loose and tight. Some women may take a few extra precautions and thin the paste for the finer fabrics, but often even this slight variation is not made.

Cornstarch is used almost exclusively in the home laundry. This may be bought as ordinary lump starch or it may be a thin-boiling starch packaged under a variety of trade names. The thin-boiling starches are generally ordinary cornstarch which has been subjected to the action of dilute alkali or acid. Manufacturers say that thin-boiling starches penetrate better than the stiffer pastes and consequently give a finish which will not rub or scale so readily as the heavier pastes. Some women add a little butter or lard and sometimes salt with the idea that this keeps the iron from sticking. Aside from these few variations, all fabrics are treated practically alike.

Mill Facilities for Finishing

In the mill every different fabric has gone through a special treatment and the method of finishing plays a very important part in the character of the finished product. Not only are the sizing ingredients varied, but the methods of pressing and drying are very different. Lack of such facilities in the home necessarily limits fabric finishing. But there can still be a great improvement if a little more care is taken in the proper selection of sizing ingredients for a definite fabric.

Experiments have been made in the Bureau of Home Economics as a preliminary step toward the solution of this problem. Approximately 25 different common cotton fabrics were laundered and ironed but not resized. The effect of the laundering operation was then observed by making a comparison between the original and the laundered fabrics. From those studied three widely different fabrics

FIG. 58.—Restoring the finish to laundered fabrics

were selected as representative of a large percentage of the cotton goods on the market and suitable for experiments in finishing. Various sizing mixtures are now being applied to these fabrics and studies are being made on the effect of different ingredients in varying concentrations upon them. (Fig. 58.)

Starch pastes mixed with various oils in order to give the required amount of softness form very good finishes for fabrics where the percentage of sizing ingredient desired is rather high. Wheat starch seems to give a bit more elastic finish and for this particular purpose is perhaps a little better. However, rice and corn starch each give very satisfactory results. It is well to use about 1 part of oil to 3 parts of starch and 60 parts of water. Of course, proportions will have to be varied slightly, according to the fabrics to be starched and one's individual tastes in the matter. Turkey red oil, palm oil, coconut oil, and cottonseed oil all give very good results.

Gelatin for Thinner Fabrics

Thinner fabrics such as voiles, batistes, and organdies need a certain amount of crisp springiness which is obtained when gelatin or gelatin in combination with alum or glycerin is employed. A stock solution of gelatin can be made by heating together 1 pint of water and 1 ounce of gelatin until the gelatin has completely dissolved. A little borax helps to preserve it, and the mixture can be kept and used on several occasions. One part of the gelatin stock diluted with 5 parts of water makes a very good general proportion for thin garments. A 6 per cent alum solution preceding the gelatin treatment gives a bit more permanent finish to the fabric. The addition of a trace of glycerin to the solution causes the finish to be less harsh. Material as heavy and of the nature of cotton suiting requires very little body, but softening agents are necessary to give the requisite feel. Many fabrics, of course, lose much of their original appearance through shrinkage and consequently can never be completely restored by household methods.

Aside from the sizing ingredients added some attention should be given to the padding of the ironing surface and to the temperature and pressure used in ironing. Many of the finer fabrics look pulled and the threads mashed because of too great pressure and usually too high a temperature. Better results are obtained if such fabrics can be stretched, leaving the threads firm and round. It is a difficult problem to restore the body to a fabric without making it boardy or the sheen without flattening or pulling the fibers. These many individual phases of the big problem of finish restoration offer openings for investigations which must be undertaken and solved before the home laundering process can be entirely successful.

ESTHER C. PETERSON.

COTTON Grower Often Finds Larger Outlay Pays in Bigger Yield One of the easiest and least expensive practices for improving cotton yields is the growing of legumes as catch crops, winter-cover crops, or as part of the regular cropping system. They can be used as seed or used for hay, for grazing, for market, or for turning under. Cowpeas and velvet beans can be used or other legumes, like soy beans, peanuts, vetches, bur clover, Lespedeza, and red, crimson, alsike, and sweet clovers, and Canada field peas.

These crops add to the soil differing quantities of nitrogen and vegetable matter which tend to increase its crop-producing power.

To get the full benefit from growing these soil-improving crops, it is necessary that they be alternated with cotton and the other crops of the system, or shifted from field to field periodically, in a somewhat definite though elastic method of rotation.

The Mississippi experiment station by planting cotton after corn and soy beans on four fields of delta land in 1924, 1925, and 1926 got an average yield of seed cotton that was 24.7 per cent greater than the yield from cotton following corn. (Mississippi Experiment Station Circular 71.)

The United States Bureau of Soils, in an experiment in eastern South Carolina covering six years, on fine sandy loam got an average yield from cotton following cowpeas that was 23 per cent greater

than the yield from cotton following cotton. (United States Department of Agriculture Bulletin 1377.)

The cropping system of the farm, however, should not be planned with the rotation as the main object or end to be attained. Such attempts have produced unprofitable systems. The more successful cotton farmers, in planning their cropping systems to meet farm needs and physical and economic conditions in their respective areas and localities, are devoting from a small percentage up to even two-thirds of their crop land to cotton. Rotation is then used so far as practicable as a means or method of influencing cotton yields.

The use of commercial fertilizers to maintain and increase cotton yields is rather generally practiced, particularly in the eastern humid sections of the Cotton Belt. Unfortunately in many cases apparently too little is used, or it is used without enough skill to secure the best results.

Fertilizer's Effect in Georgia

A study was made of the effect of fertilizers used in varying quantities on cotton on 91 farms in Sumter County, Ga., in 1924. Increasing the quantity of mixed fertilizer per acre above 150 pounds

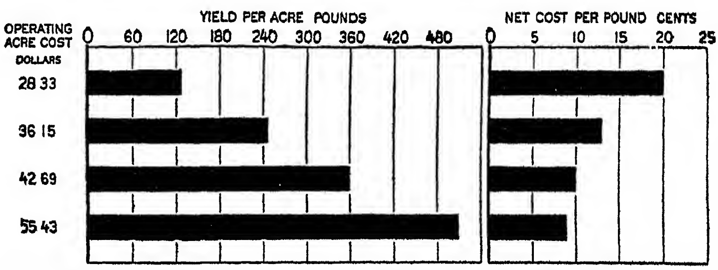

FIG 59.—Increased expenditure per acre on these farms brought increased yield per acre and decreased cost per pound

brought increasing yields, but on the average if an application of less than 300 pounds was used to an acre the additional yields were not of much more value than the cost of the additional fertilizer above 150 pounds. Maximum returns from cotton, under average conditions, were not obtained when less than 450 to 500 pounds of mixed fertilizer was used per acre.

As quantities of nitrate of soda were increased over 40 pounds per acre the additional yields increased rapidly so that when 120 pounds were used the value of the additional yields was over $10 and the cost of the nitrate used was only $3.60.

With conditions as they prevailed in 1924 and with cotton at 21 cents a pound, mixed fertilizer at $27 per ton, and nitrate of soda at $60 per ton, it would have been profitable for most farmers in the community to have increased the average applications of mixed fertilizer and nitrate of soda.

The thrifty cotton farmer finds that it pays to use approved practices to protect his cotton from insect damage, especially from boll-weevil damage, particularly if he has made other expenditures to increase yields. In Sumter County, Ga., in 1924 the most profitable applications of calcium arsenate for poisoning the boll weevil were from 25 to 30 pounds per acre put on in four to five applications.

Other factors that may influence cotton yields which can merely be mentioned here are methods of tillage, varieties, seed selection, care of the seed, methods of planting, time and method of harvesting, etc.

Economy of Increased Expenditure

Factors and practices designed to maintain or to increase cotton yields necessitate increases in expenditures per acre on the crop. But increased expenditures per acre, if wisely applied, tend not only to increase the yield in weight but to increase profits by lowering the cost per pound.

Figure 59 shows the average effect of increase in expenditures per acre on the yield of lint cotton per acre and on the cost per pound, on 401 farms scattered throughout the Cotton Belt, in 1926. (See Crops and Markets, U. S. Department of Agriculture, June, 1927.)

C. L. GOODRICH.

COTTON Harvesting by Newer Methods Saves Much Labor

The cotton crop, until recent years, has been harvested exclusively by hand picking. In about 1900, growers in certain parts of Texas and Oklahoma, where a considerable part of the crop fails to mature in some years, began the practice of gathering by snapping or pulling immature bolls or bollies. In the more subhumid parts of Texas and Oklahoma, where cotton has but recently become of importance, a considerable part of the crop usually fails to open properly and in some years much of the crop which has fully opened can be picked after a killing frost only with difficulty, as the stems by which the bolls are attached to the plant are so brittle that they fall from the plant at a touch. Growers were not long in adopting the method of harvesting by snapping or pulling that part of the crop which had opened as well as the bollies that remained in the field after a killing frost.

The harvesting operation is of particular importance to western growers. In these areas conditions are ideal for the use of large machines and the farm family can raise more cotton up to harvesting than they can pick or snap. For this reason much of the cotton produced in these areas has been harvested by hired labor.

In the fall of 1926 these western cotton growers faced a new harvesting problem. A large crop had been produced, but weather conditions were extremely unfavorable for harvesting during the early fall. Principally because of the large cotton crop in the United States, prices declined severely and many a grower found that his crop would hardly bring enough to pay usual harvesting and ginning expenses. Then, too, not enough labor was available to harvest the big crop by the usual harvesting methods. Under these conditions the cotton sled, which had been used only to a limited extent in preceding years, came into prominence for harvesting the crop.

Requirements for picking an acre of cotton yielding 160 pounds of lint are estimated to amount to 40 or 50 per cent of the total labor required for producing cotton in western Texas and Oklahoma. Growers who harvested their crop by snapping instead of picking reduced their harvest labor requirements about 35 per cent as compared to a reduction of about 90 per cent when the sled was used. In the eastern Cotton Belt harvest labor requirements usually amount

to from 30 to 40 per cent of the total labor required for producing an acre of cotton yielding 160 pounds. It is estimated that on the average about 120 hours of labor are required to pick sufficient seed cotton to make a bale of 500 pounds lint in the eastern belt as compared with 60 to 70 hours for picking, about 45 hours for snapping, and about 7 hours for sledding this quantity of cotton in western Texas and Oklahoma.

Better-Built Sleds Expected

The sled of 1926 was usually made by the grower and was often hastily and poorly constructed and often inefficiently operated. Even under these conditions their use was decidedly advantageous to western growers under the conditions that existed in 1926. Much improvement can be expected in the future in the way of better sleds, and distinct types suited for harvesting cotton of different plant growth may well be anticipated.

The use of sleds, or of the snapping method of harvesting cotton, in the eastern Cotton Belt would be of doubtful value. Before cotton can be harvested by either of these methods it must be frosted. Much crop damage would occur in these eastern areas if the cotton was left in the field until after frost, since fall rains are often heavy and killing frosts usually occur late in the season. Then, too, cotton acreages are smaller, labor is more plentiful, and wages are usually lower than in the western areas.

It is probable that machines which are suitable for harvesting cotton will soon be obtainable. Machine pickers were reported to have made satisfactory field tests during the 1926 season. Should these machine pickers be as successful as now appears probable, their use will be of particular value to growers in the more humid cotton-producing areas who have rather large acreages of cotton.

A. P. Brodell.

COTTON in Farm Women's Garb Partly Replaced by Silk and Rayon

The last five or six years have seen a marked change in the style of garments worn by women and girls. Only a few years ago women's and misses' undergarments, summer dresses, and stockings were practically all of cotton. But to-day silk and rayon play a prominent part. In order to determine the extent to which silk and rayon have been substituted for cotton in the different garments worn by women and girls, and to find the explanations which the women themselves give for making this change, a survey was conducted in the spring of 1927 by the Bureau of Home Economics, on the uses of cotton in clothing and household articles.

The trend of fashion among rural people is clearly indicated by the answers of the 231 farm home makers included in this survey. A comparison between the kind of material which these women wore during the year ended in the spring of 1927, and that which they wore during the corresponding year five years ago, shows that 87 per cent of the 231 farm women wore more silk or rayon stockings during the past year than five years ago; 61 per cent more silk or rayon summer dresses; 49 per cent more silk or rayon bloomers; 48 per cent more silk or rayon slips; 46 per cent more silk winter dresses; and 35 per cent more silk or rayon chemises.

Degree of Cotton Replacement

This, of course, does not mean that silk has completely replaced cotton for these garments. The figures merely indicate that a certain percentage of the farm women included in the survey wore more silk garments of certain kinds during the past year than they wore five years ago. Some women, for example, may have worn silk summer dresses only on very special occasions during the past year, whereas five years ago they may not have worn them at all; or for some women a silk garment, such as a slip, worn this year, but not five years ago, may have replaced a cotton underskirt. But in both cases the results would be that more silk was worn this year than five years ago.

Cotton has held its own in other garments, however. Ninety-eight per cent of the women report "no change" in kind of material worn in aprons; 94 per cent in nightgowns; 84 per cent in house dresses; 69 per cent in kimonos; 60 per cent in bathrobes; 68 per cent in brassieres; 56 per cent in union suits; and 49 per cent in undershirts.

The women who are wearing more silk or rayon now than five years ago were asked to give their reasons for choosing silk or rayon instead of cotton. An analysis of their reasons throws interesting light upon alleged advantages of one kind of material over another. Most of the women gave more than one reason in explaining why they chose silk instead of cotton. Of the women reporting more silk summer dresses, 50 per cent stated that silk was worn rather than cotton because the silk was easier to launder. Forty-six per cent stated that silk summer dresses are "more attractive" than cotton; 16 per cent that silk dresses are cooler; and 13 per cent that silk wears longer than cotton. More than one reason was generally given by those answering this part of the questionnaire.

Of the women who reported wearing more silk winter dresses during the past year than five years ago, 29 per cent gave as one of their reasons the greater attractiveness of silk winter dresses; 14 per cent the longer wear of silk; 16 per cent ease in laundering or cleaning; and 12 per cent the ease of pressing silk.

The number of women who reported changing from cotton to silk was larger for stockings than for any other garment. Fifty-two per cent of these women stated that they wore silk hose because they were "more attractive" than cotton ones; 20 per cent gave longer wear as a factor in their choice; 17 per cent thought silk cooler; and 16 per cent preferred the feeling of silk to cotton.

The reasons advanced by the women who reported changing from cotton to silk or rayon during the preceding five years varies for the different garments. Certain reasons were given more persistently than others, however, and might therefore be listed as the most important ones. Laundering was listed by the greatest number of women, for summer dresses, underwear, and nightgowns; whereas "more attractive" was given by the largest number for winter dresses, kimonos, and stockings. "More attractive" was also an important reason for summer dresses; "less bulky" and "preference for the feeling of silk" received second place for underwear.

EDNA L. CLARK.

COTTON Pest Related to Boll Weevil Now Quarantined in West

One of the most outstanding results of the invasion of the Cotton Belt by the cotton boll weevil is the gradual shifting of the center of cotton production westward. The fact that the cotton boll weevil may cause a loss of 40 per cent of the cotton crop at a certain latitude and elevation in Georgia, for instance, and at the same latitude and elevation in West Texas cause a loss of less than 5 per cent, is accounted for by the difference of a few inches of rainfall during the months of June, July, and August.

Improvement in the dry-land farming methods of cotton culture and the opening of irrigated regions to the growing of the crop have made it possible to grow this staple in these regions with comparative immunity to the boll weevil. The discovery of a native race of the cotton boll weevil on wild Thurberia plants in desert regions of Arizona was, therefore, cause for considerable apprehension on the part of cotton growers of dry-land farming and irrigated regions.

Centuries ago, nature was doubtless at work evolving from the parent boll weevil stock in Mexico a weevil which could withstand drought, high temperatures, and low temperatures that would be disastrous to the boll weevil, and which, moreover, was capable of thriving on either cotton or Thurberia, a plant botanically related to cotton. The result is the Thurberia weevil, also referred to as the "Western" boll weevil or "Arizona boll weevil." This insect is native to the mountains of Arizona where its wild host, the Thurberia plant, thrives.

While the Thurberia weevil, is, on the whole, a trifle larger than the cotton boll weevil there are individuals of both insects which resemble each other so closely that they can scarcely be distinguished from each other even by a trained entomologist. The two insects interbreed freely and are in fact so closely related that entomologists regard them as mere varieties of the same species of insect.

Thurberia Weevil Withstands Dry Weather

While the cotton boll weevil has repeatedly gained a foothold in the cotton-growing regions of the western part of the main Cotton Belt the dry, hot weather of these regions has, time and again, wiped out the pest or reduced it to innocuous numbers. The Thurberia weevil on the other hand is native to the drought-ridden areas of southern Arizona where it is compelled to withstand even dryer weather and higher temperatures than those which prevail in the western part of the main Cotton Belt.

During the course of its long association with the Thurberia plant the Thurberia weevil has undergone many interesting adaptations. Among these is the ability to remain in a dormant condition during the hot summer months until late summer rains stimulate its host to growth. At the approach of cold weather many of the insects construct tight cells in which they may hibernate. These cells greatly resemble cottonseed and are so tough that many of them may go through the gin and come out unharmed with the seed. Consequently the Thurberia weevil is more easily spread in shipments of seed than the boll weevil.

But while the Thurberia weevil commonly hibernates in toughly constructed cells, investigations of the Bureau of Entomology show

that many of them hibernate in trash along fence rows and other protected places in the same manner that the boll weevil does. It has been found, too, that the rate of winter survival of the Thurberia weevil is much greater than that of the cotton boll weevil, being, in instances, perhaps as much as 10 times greater. Investigations conducted by the Bureau of Entomology with a view to determining whether the Thurberia weevil is likely to prove destructive as a cotton pest show that the insect takes as readily to cotton as to Thurberia, and after a time may even show a preference for cotton. During the crop year of 1926 inspectors of the Federal Horticultural Board and the Bureau of Entomology found one cotton field in which a considerable infestation had been built up through natural spread from the wild host of this pest, the nearest plants of which were at least 12 miles distant.

Insect Rightly Causes Concern

It will thus be seen that cotton growers of the dry-land farming and irrigated regions are warranted in being much concerned over this insect. Indeed, if ability to withstand drought and high temperature, and ability to survive the winter mean anything, not to mention its distinct preference for cotton bolls over cotton squares, the pest might even be regarded as a super boll weevil.

Quarantine No. 61 against the Thurberia weevil became effective July 15, 1926. The territory immediately affected by the quarantine was practically confined to the cotton cultures in the Santa Cruz Valley of Arizona extending from Nogales north to and including the so-called Postvale area. Under the provisions of the quarantine all cotton gins in the regulated territory were required to be equipped with cottonseed-heating machines whereby cottonseed was heated to a temperature which would kill all stages of the Thurberia weevil before the seed was discharged from the gin. This same requirement is made in territory quarantined on account of the pink bollworm. All cotton lint grown in the area is required to be fumigated under the supervision of an inspector. All farm household goods, railroad cars, and other things and substances likely to be contaminated with cotton products are required to be inspected and cleaned or fumigated in such manner as may be necessary to prevent the dissemination of the Thurberia weevil. Road stations were established on five roads leading out of the area to prevent the movement of quarantined articles over the highways. During the first fiscal year a total of over 800 permits were issued under the provisions of this quarantine for the movement of various products after the same had been inspected and rendered safe for movement interstate; 1,039 lots of dangerous cotton material were intercepted at the five road stations and over 8,000 bales of cotton were fumigated for interstate shipment.

The 1926 crop in the Postvale area was released from the operation of the quarantine on November 19, 1926, under an injunction in Federal court. The injunction was granted on the ground that no infestation had been found in the 1926 crop up to that time. Subsequently inspectors of the Federal Horticultural Board discovered infestation in the Postvale crop.

As a result of this order, cottonseed from cotton grown in the Postvale area in 1926 was not sterilized after November 19 of that year.

Owing to the requirements of the States into which Arizona cotton lint is generally shipped, control measures similar to those of the quarantine were, for the greater part, carried out so far as lint is concerned.

Found in Cochise County, Ariz.

Since quarantine No. 61 was promulgated, inspectors of the Federal Horticultural Board and the Bureau of Entomology have found the Thurberia weevil in practically all cotton plantings of Cochise County, Ariz. This extends the range of the Thurberia weevil eastward right up to the New Mexico line, and on July 9, 1927, the quarantine was amended accordingly. The accompanying map (fig. 60) shows the range of the Thurberia weevil as at present known.

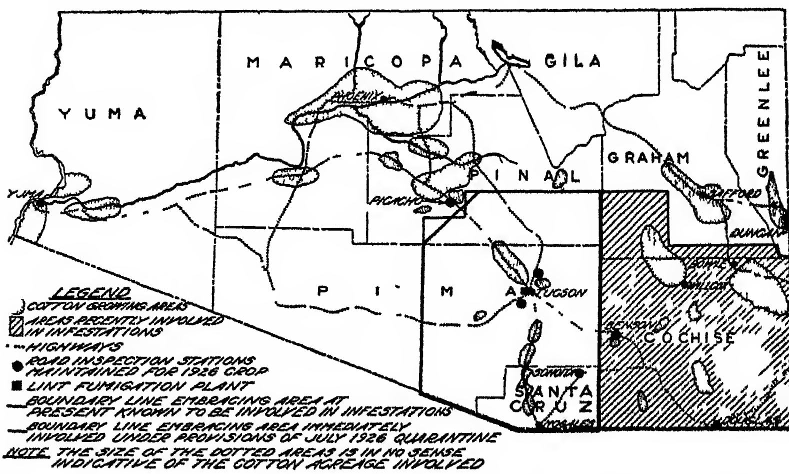

FIG. 60.—Map of southern Arizona showing areas affected by Thurberia-weevil quarantine, June 30, 1927

Cochise County is so poorly adapted to cotton growing that the production of cotton, which was merely being tried out experimentally, is likely to be abandoned. The significance of the discovery of the Thurberia weevil in this county, however, lies in the fact that practically all of the mountain ranges of the county are infested with weevils and the insect is likely to be floated down the washes in its water-tight cell and eventually to be deposited in the Safford Valley from which, in turn, it may spread by similar means to the cotton cultures farther down the Gila River, thereby menacing the Florence-Casa Grande and even the Salt River Valley plantings.

G. G. BECKER.

COTTON-SPINNING Value Studies Show Need of Higher Qualities

Variability in the elements of spinning utility is a characteristic tendency of cotton fiber. To the variability of fiber arising from varietal differences must be added that occasioned by the great diversity of soils and climatic conditions prevailing in the Cotton Belt.

The bulk of the American cotton crop is not normally grown from improved varieties. It is estimated that in Texas, for instance, more

than two-thirds of the crop is grown from "gin-run" seed of uncertain adaptation and spinning quality.

Out of the variability of cotton fiber and certain improvements in the methods of production and manufacture came a need for fixed standards for the measurement of fiber quality which, in turn, indicated market value.

With the invention of the telegraph and the laying of the Atlantic cable, it became less necessary for buyers actually to come together in the same market. With fixed standards for grades and staple lengths, the trading might be carried on over long distances. The cotton might then be placed in a warehouse and sold on description.

During the latter part of the eighteenth century, following the invention of power-driven machinery for spinning and weaving and of the cotton gin, new problems arose, unheard of in cotton growing, marketing, and manufacture under the more primitive economy. As cotton growing developed on an extensive commercial scale in response to an increasing demand, the fields grew in size until the growers could no longer harvest the crop with the promptness to which they were accustomed when less was grown. The cotton remained longer in the fields exposed to the weather, and picking was more carelessly done than in former times.

Still another factor influencing the grade and spinning quality of cotton has been the process of ginning. Although the invention of the gin greatly facilitated the removal of the seed from the fiber, it did so with greater damage to the lint than that resulting from hand separation. Many improvements have been made in the cotton gin since 1793. If the gin is properly operated, the staple may be separated from the seed very satisfactorily, but there is so much incentive for ginners to rush and speed up the machinery that the lint is far too frequently damaged seriously in ginning.

Thus, early in the history of commercial cotton growing, gin damage in addition to weather damage, leafiness, and the presence of other foreign matter made grading of the cotton necessary as a means of arriving at its market value.

Needs of Futures Markets

Again, the opening of the futures markets made it necessary to conduct trading in accordance with definite concepts as to the grades which could be tendered on contracts. Many grades came into use, but they were far from satisfactory for they were seldom the same in any two markets. Middling cotton in New Orleans, for example, would not necessarily be Middling in Savannah or Liverpool. Liverpool had a set of standards of its own.

Public sentiment favoring official standards led to the enactment of the United States cotton futures act of August 18, 1914. The first length standards, provided for in the cotton futures act, became effective October 25, 1918. These standards apply only to trading in the United States, not having been adopted as yet abroad. The official standards for grade, 9 in number, were next promulgated. Then came official standards for 11 grades of tinged and stained cotton. These official standards for grade were all tenderable on futures contracts prior to March 4, 1919, when the number of tenderable grades was reduced to 10. To these 10 there were added 6 additional tenderable grades effective August 1, 1923. Later another was added,

making in all a total of 17 grades which are tenderable on futures contracts on American exchanges. These are included in the 32 grades recognized as the universal standards for American cotton, which, having been adopted by the leading cotton exchanges of Europe and having been repromulgated by the Secretary of Agriculture, became effective as universal standards on August 1, 1924.

The grade and staple standards thus far adopted by the United States Department of Agriculture have been employed as the basis for the classification of cotton traded in on the spot and futures markets and for arbitrations at home and abroad.

New Uses for the Standards

Of late new use has been made of the grade and sample-length standards. From early times, a reliable inventory of the number of bales of cotton annually produced has been made from year to year. The size of the crop thus enumerated has had its obvious influence on prices received in the different markets. An increase in production tends to lower prices, whereas a decrease tends to elevate them. No similar inventory as to the quality of the American cotton crop annually produced has ever been made. Yet, it is a well-known business fact, as well as a sound economic principle, that an improvement in the quality of a commodity, consistent with its customary utilization, tends to increase consumption and to improve prices. A recent study of the consumption of cotton by American mills indicates that in the United States the demand is greatest for Strict Low Middling, Middling, Strict Middling, and Good Middling from fifteen-sixteenths to 1 inch in length. According to this study, the demand for Strict Good Middling was, for the year ended August 1, 1927, 1.67 per cent of the whole; for Good Middling, 16.18 per cent; for Strict Middling, 25.33 per cent; for Middling, 21.82 per cent; and for Strict Low Middling, 21.72 per cent. The total of the percentages of cotton consumed in the four grades from Low Middling to Good Middling, inclusive, amounted to 85.05 per cent of the total consumption. The demand for all of the lower grades put together amounted to but 13.28 per cent of the total.

The demand in the United States for cotton below seven-eighths of an inch in length amounted to less than 0.1 per cent, but the demand for $\frac{7}{8}$-inch cotton amounted to 19.25 per cent; for $\frac{15}{16}$-inch, 34.48 per cent; for $1\frac{1}{32}$-inch, 34.49 per cent; and for $1\frac{1}{16}$-inch and upward, but 11.7 per cent of the total consumption.

No inventory of the grade, staple length, and tenderability of American cotton had ever been made until the present cotton-marketing season, when such estimates were made for two areas—one comprising the State of Georgia and the other comprising 21 counties in the Panhandle of Texas and 6 adjacent counties in southwestern Oklahoma. Excluding the longer-stapled cottons of the Mississippi Valley and the irrigated districts in the Southwest, we might for our present purpose consider that cotton grown in Georgia [3] at least roughly typifies, in the matter of grades and staple lengths, cotton grown in the Atlantic States and that cotton grown in the Texas-

[3] YOUNGBLOOD, B., and LANHAM, W. B. COTTON GRADE AND STAPLE REPORT FOR THE STATE OF GEORGIA: Nov. 28, 1927.

Oklahoma area may roughly represent the upland growth, particularly as to length in the plains region of Texas. The cotton grown in the black-land belt of Texas has for many years been considered typical of the upland cottons grown in the State. No estimate of the grades and staples from the black lands has been made. The data from the Texas-Oklahoma and the Georgia areas are used because they are the only figures of their kind available rather than as correctly reflecting grades and staples produced in the United States as a whole.

Practice of Georgia Mills

The total mill consumption of cotton in Georgia is about equal to its total production, yet Georgia mills go out of the State for a great deal of cotton. Although 78.03 per cent of the cotton ginned in Georgia up to November 1, 1927, was seven-eighths of an inch in length, only 24.81 per cent of the mill consumption of that State for the year ended August 1, 1927, was of that length. Although the production of $\frac{15}{16}$-inch cotton amounted to 16.2 per cent of the total production in Georgia, 52.77 per cent of the total mill consumption of that State was fifteen-sixteenths of an inch in length. Although only 4.09 per cent of the cotton ginned in Georgia was 1 inch or more in length, 22.42 per cent of the cotton consumed by the mills in that State was found to be 1 inch or more in length.

This comparison clearly shows that although Georgia produces a great deal more of the shorter lengths, seven-eighths inch and under, than is consumed in that State, it produces a great deal less cotton of fifteen-sixteenths inch and longer than it consumes. This suggests a decided opportunity in Georgia to improve staple length to the advantage of both growers and manufacturers.

Since there is little consumption of cotton by mills in Texas it is impracticable to compare the proportion of the grades and staple lengths ginned in the area studied with mill consumption in that State. But it may not be out of place for the present purpose to compare the percentages of grades and staple lengths ginned in the Texas-Oklahoma area with the national demand percentages.

Although American mills consume less than 1 per cent of cotton below seven-eighths of an inch in length, 14.31 per cent of the ginnings in the Texas-Oklahoma area studied was of this length.[4] Although 19.25 per cent of the national consumption was seven-eighths of an inch in length, 37.95 per cent of the ginnings of the Texas area was of this length. Although 34.48 per cent of the national consumption was fifteen-sixteenths of an inch in length, only 29.37 per cent of the cotton ginned in the Texas-Oklahoma area was of that length. Although 34.49 per cent of the national consumption was 1 inch to 1 $\frac{1}{32}$ inches in length, only 16.46 per cent of ginnings in the Texas-Oklahoma area was of that length. Although 11.7 per cent of the national consumption was 1 $\frac{1}{16}$ inches and longer, only 1.92 per cent of the cotton ginned in the Texas-Oklahoma area up to November 1 of the season 1927–28 was of those lengths. This indicates that the production of better staple lengths in the Texas-Oklahoma area is not proportionate to the national demand.

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[4] YOUNGBLOOD, B., and LANHAM, W. B. GRADE AND STAPLE REPORT, TEXAS-OKLAHOMA AREA: Nov. 28, 1927.

More Income through Quality

These data suggest that when the facts are known concerning the grade and staple length of the cotton produced, as well as that of cotton consumed, it may be found that the mills of the United States demand cotton averaging higher in spinning quality than is annually produced. Were production to improve as much in grade and staple length as may be consistent with good farm husbandry, our national income from cotton exported might be greatly increased without increasing the supply. Moreover, our manufacturers might find it easier to overcome the competition of foreign cotton goods and goods manufactured from other fibers.

Thus, it is possible that the universal standards for American cotton may be put to the new use of inventorying the annual production and the annual consumption by spindles in the United States. By many engaged in cotton growing, marketing, and manufacture, information concerning the spinning utility of the American cotton crop is considered to be fundamental to further progress in the industry.

B. YOUNGBLOOD.

COTTON Trade Feels Changes of Styles in Women's Clothing

Cotton is the third largest agricultural crop in the United States and the cotton fabrics industry the seventh in value of products. The success of these enterprises is, therefore, of great importance to the general prosperity of the country and should be of especial interest to women, since a large part of the output goes into clothing and fabrics used in the household.

Surprising as it may be, the majority of cotton textiles are not used for clothing or household purposes. However, enough are employed for this purpose to make women's desires and needs of moment to the industry. When style demands the use of large quantities of cotton or any other one material, the production of that fabric increases to the point necessary to cover the demand. This often requires expansion throughout that particular industry. Then perhaps in the years immediately following the style changes, less yardage of a given kind is needed, the demand drops suddenly and all those engaged in producing these products must quickly rearrange their organization or face disaster.

Effect of Styles on Demand

On account of the significance of these changes to American agriculture, the Bureau of Home Economics has interested itself in the problem particularly from the standpoint of clothing design and the suitability of various fibers for different purposes. An attempt was made recently to determine the influence of dress styles and patterns on the consumption of yardage. The results of the study showed that during the past 10 years there has been a marked decrease in the amount of fabric required for women's dresses. About 2 yards less of material is needed now for each dress than was required in 1918. However, this is due almost entirely to the changing styles in skirt and sleeve length and not to changes in design. A casual observation might seem to disprove this, but a critical analysis brought out the fact that, as far as fundamental design and silhouette are concerned,

there has been a tendency to keep to simple lines and the practical one-piece dress which conforms very closely to art principles.

It is perhaps unsafe to venture prophesies as to how long this will last, but it is obvious that standards of taste are improving and a consciousness of what is good design is rapidly growing in this country. Schools and other educational agencies, of which the extension service of the department is one, are spending more and more time on this phase of education and it may reasonably be expected that changes in style will not be radical and will develop along artistic lines. The present athletic interests of women and their broader activities in professional and business life also tend toward a standardization and conservatism in dress among large groups of women.

Such standardization would be of tremendous aid in stabilizing our textile industries. While no one would wish to deprive the world of the increased interest and pleasure brought by reasonable changes in style, it is possible to have the advantages of good style without the frequent changes which are costly to the consumer and also to the manufacturer who must discard the machinery he has been using. In fact, many of these changes are brought about merely at the whim of designers and are economically unsound for all concerned. This is realized only too well by the woman who, having purchased a durable dress, finds it out of style long before it is worn out.

Some Manufacturers Lagging

In many instances manufacturers have failed to keep abreast of the present rising standards. Another study made in the bureau last year gave some interesting facts on the designs of fabrics now on the market. There has undoubtedly been more effort placed on the manufacture of beautiful silk fabrics than of cotton materials. Cotton fabrics with artistic designs of real character are often hard to find, especially those suitable for clothing for mature women. The inherent qualities of cotton, such as its coolness, ease of laundering, and durability are sometimes overlooked because the designs offered are unsuitable and not in keeping with the present standards of taste. It is hoped that some of the recommendations which are being made as a result of this study will be reflected in future cotton fabrics. However, wise and discriminate selection from the fabrics available in the past would have brought much satisfaction to the many women who are living in parts of the country in which cotton is the ideal fiber for clothing.

A wise selection of dress designs is also just as important in connection with making or choosing cotton dresses as it is in the case of other more expensive fibers. Certain patterns give more satisfaction if made up in wool; others if made in cotton and so on. A number of cotton dresses have been made in the laboratories of the bureau to show some of the dress designs which are the most appropriate for use in connection with certain American-made cotton fabrics. These emphasized the fact that proper attention to fabric texture, color, and design in relation to garment design is very important.

Cotton is also an ideal material for children's clothing and in many parts of the country can be worn all the year around with comfort. Here again studies have shown that much is yet to be done before we have the best possible cotton fabrics for the various

uses to which they can be put in children's clothing. Suitability is one of the most important considerations and every fabric manufactured or purchased should be judged primarily from the standpoint of its suitability for the purpose for which it is intended.

RUTH O'BRIEN.

COTTON Wastes are Turned by Chemists into Profit Sources

For centuries chemistry in the cotton industry was confined chiefly to the commonplace application of well-known principles and formulas in the bleaching, dyeing, and printing of cotton. The first noteworthy new application of chemistry to the cotton industry occurred in 1844, when John Mercer discovered the process, now known as mercerization, by which cotton goods are made more pleasing to the eye as well as more durable.

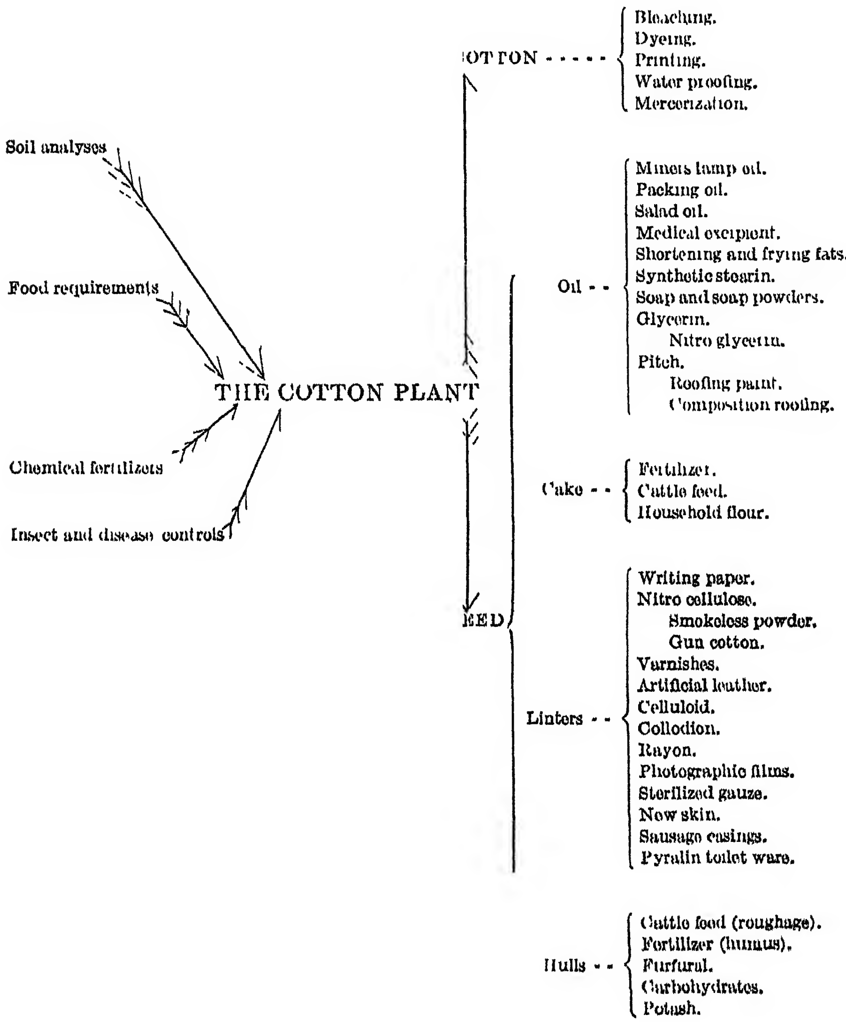
Early in the seventeenth century the Chinese knew that cottonseed contained an oil, for it is reported in their records that in preparing cottonseed for feeding cattle they first extracted the oil, which they used for illumination purposes, and then cooked or boiled the seed. But it was not until the last of the eighteenth century that the possible value of cottonseed oil began to attract attention outside of China.

During the past century cottonseed remained so expensive a refuse as to necessitate sanitary laws providing for the disposition of seed not required for planting and other minor farm uses until some unrecorded chemist discovered that cottonseed oil was edible. By 1860 seven mills had been established for extracting the oil. By 1890 over a million tons of the seed were being diverted from unproductive refuse heaps into the oil mills, where the oil, the only ingredient then considered valuable, was expressed. Every effort of the mills was, therefore, directed toward improving the methods of extraction. Under the best crushing procedure then in vogue considerable oil was forced into the fuzz-coated hulls and was thus lost. The first step forward was the development of machines for decorticating the seed and separating the meats and hulls, resulting in much more efficient oil extraction, and, of almost equal value in a coincident improvement in the quality of the cake. The new cake, because of its nitrogen content, soon became in great demand as a fertilizer; and because of its high protein content and freedom from fiber, a valuable concentrated cattle feed.

Economic necessity for a more perfect separation of the meats from the hulls suggested the possibilities of delinting the seeds before hulling them. Modified cotton gins called linter machines were devised and were soon removing the residual seed hairs that had escaped ginning, to prepare the seeds for better separation of the meats. This new form of cotton ultimately became known as "linters" after the name of the machine by which it was recovered.

The industry had now reached the stage where the seeds were mechanically separated into their four primary elements: (1) A crude oil; (2) a more or less indifferent cake or meal; (3) linters, for which there was little or no market and which, when used, found their only outlet as mattress fillers and battings; and (4) hulls, which were generally used as fuel in the mills. Chemical research was soon to open immense markets for three of them.

Where Chemistry Touches the Cotton Industry



The increased use of cotton goods, resulting from enhanced attractiveness and durability due to mercerization, is problematical, but the diverting of 5,558,243 tons (1926) of cottonseed from the refuse pile into channels of consumption produced $256,027,431 of value that would never have existed but for the intercession of chemical research. It is estimated that possibly two-thirds of this created value reverts to the cotton grower and thus becomes an offset to the increased cost of production that has occurred during the rise of the crushing industry.

Refining Oil a Chemical Art

The refining of cottonseed oil is a chemical art, for the mere purification by settling and filtration produces an oil hardly fit for other

than illumination purposes. Chemists soon found means for refining the oil, but they did not stop there, for they analyse the oil, graft extra atoms of hydrogen onto the oil molecule, converting it into fats or tallows, or they direct the separation of the various components of the oil and convert each of them into new and useful articles.

Cottonseed meal, the ground cake or kernel residue after the oil is expressed, now finds its chief use as plant and cattle feed. But during the World War processes were discovered by which the meal is refined and made desirable for human consumption. In addition to being satisfying to the palate, this new food is useful in cases where physical ailments make it advisable to subsitute proteins for starches.

Chemistry has literally created a market for linters, the lowly form of cotton, which less than two decades ago found use only as batting and mattress filling. The cellulose, which constitutes about 85 per cent of the composition of linters, is now transformed into such antithetical commodities as high explosives, surgical dressings, and new skin; artificial leather and sausage casings; roofings and floor coverings, and wearing apparel; lacquers, varnishes, photographic films, toilet articles, and billiard balls.

Hull Utilization Still a Problem

Hulls alone of all the products of the crushing of cottonseed now remain most nearly in the category of waste. But the hulls contain numerous desirable chemical substances, such as furfural, acetic acid, alcohol, tar and other hydrocarbons, as well as potassium and compounds of carbon and sodium that await only the discovery of economical methods of recovery.

G. S. Meloy.

COUNTY Agents Build Better Agriculture Through Group Action

County agricultural agents have given substantial aid to farmers and their families in improving the production and marketing of their products. The most effective results have been obtained where the joint effort of the county agent and the local people has been concentrated on meeting not more than two or three of the more outstanding farm problems of the county at one time. In nearly every county there are a few outstanding problems which lie in the field of extension work, and which prevent farming and country life from being as profitable and as satisfying as they might be. Thus in some Eastern States where dairying is an important industry the chief problems which usually have been found are: How to produce alfalfa necessary to cut feed costs; how to replace scrub bulls; how to eradicate tuberculosis; how to develop a more effective system of marketing; what additional enterprise to add to dairying to increase farm income.

Where such problems prevail and a county agent has been permitted to work on a limited program of this kind he has usually made a larger contribution to the farming of his county than where his efforts are spread over a large field. Since the great majority of people in the county are affected by one or more of these problems

it has naturally followed that all have benefited when the county agent has been allowed to concentrate on these fundamentals. (Fig 61.)

Definite Programs Produce Best Results

It has not been the many little things, the personal service, the miscellaneous information given out, the number of office and farm calls, which have counted in building a better agriculture The most satisfying extension work, considering the people and the agriculture of a county as a whole, has been that which has obtained results in terms of a limited program. It is the county agent who has put alfalfa on the map, who has rid a county of scrub bulls, who has led in wiping out tuberculosis, who has helped start a new farm industry, who has aided in establishing a marketing system that

FIG. 61. The wider adoption of purebred dairy sires has been stimulated by county agricultural agents through demonstrations and judging meetings

works, who has most fully succeeded in being of real service to the people of his county. The people under the leadership of such an agent have found visible improvement in agriculture and country life. They have learned to appreciate real benefits and profits which have come to them and to the farming of a county from his efforts.

Examples of the concentrated program and the results obtained in a county in one year follow. The first is reported for 1926 by a single county agent in a New Hampshire county where the farms are all small:

165 farmers seeded alfalfa in comparison to 19 in 1922.
51 farmers used 3,500 bushels of certified potato seed.
210 farmers pruned, fertilized, and sprayed their apple trees.
170 farmers improved their methods of managing their farm poultry.
41 farmers improved their methods of managing their dairy herds.
65 farmers cooperated in planting and caring for wood lots.

In a large fruit-growing county in New York State, the agent and his assistant reported the following accomplishments for 1926:

357 farmers grew alfalfa, clovers, or hay mixtures according to recommendations.
144 farmers grew cereals according to recommendations.
132 farmers grew potatoes according to recommendations.
759 farmers grew fruit according to recommendations.
2, 340 farmers tested their cattle for tuberculosis.
265 farmers managed poultry according to recommendations.

These are but two examples of many which show how county agents who concentrate on fundamental problems have accomplished large results in a single year. Such agents are good teachers. That is, they do more than hand out information. Where an agent has done effective teaching, he has known the real needs and wants of groups of people with a common problem. He has had a practical solution for such problems. He taught so effectively that people have been led to accept the solution offered and to act accordingly since they have had confidence in his judgment and have seen the problems he has attacked as their problems. His teaching has made them win success with the new practice and they have been satisfied with what they have learned. In turn they have helped to win others over and have taught others the need for concerted action on common problems.

Solution of Problems is the Test

Such examples have given people generally a greater appreciation of the true field of work of a county agent. More and more the people have come to understand that the agent is the joint representative of the State college of agriculture, the United States Department of Agriculture, and the local people in developing and carrying on in a mutual way, plans for meeting the larger problems of farming and farm life. They have come to see the county agent as a leader who points the way to more profitable farming and more satisfying country life and teaches how these objectives may be attained. He is a public agent, and of necessity, seeks to develop the greatest good for the largest number. This translated into practice shows that he has been most successful when he has concentrated his service on a few outstanding problems long enough so that a majority of the people have accepted the solutions to these problems.

H. W. Hochbaum.

CRANBERRIES Used in Trial Forecasts as to Keeping Quality

Forecasts of the size of various crops, usually referred to as crop estimates, have been made for many years by the United States Department of Agriculture, and the value of these estimates is generally recognized. For the efficient handling of perishable fruit the quality, that is the carrying or keeping quality, is almost as important as the size of the crop. Advance information regarding the keeping quality of a crop would be of great value if such information could be obtained. An experiment in forecasting the keeping quality of the cranberry crop is now being conducted by the Bureau of Plant Industry in Plymouth County, Mass.

For such an experiment the cranberry crop of Plymouth County offers peculiar advantages. In this county the cranberry is by far the most important crop. Although the cranberries of this region are grown on a large number of bogs under different management, the bulk of the crop consists of two varieties—Early Black and Howes. Within this area is located the Massachusetts Cranberry Experiment Station, where weather records have been kept for nearly 20 years. Most important of all for this work, there is available a printed record of the keeping quality of the crop of this region for each year beginning with 1912. These records are contained in the printed reports of the chairman of the board of inspectors of a cooperative sales company which handles a large part of the cranberry crop.

The Basis of the Forecasts

The forecasts are based on the results of two distinct lines of investigation—a study of the weather conditions during the growing season, and actual keeping tests (incubator tests) of representative samples of fruit. Careful study of the weather during the growing seasons of the years 1912 to 1922 in relation to the keeping quality of the crop of those years seemed to show that a correlation existed between temperature and keeping quality. Low temperatures during May and June seemed to be correlated with good keeping quality. This correlation was especially marked when cool weather in May and June was followed by high temperatures in July and August. On the other hand, warm weather in May and June seemed to be associated with poor keeping quality, and here the correlation was closer when a warm May and June were followed by unusually cool weather in July and August. The best combination appeared to be cool weather in May and June followed by warm weather in July and August. The worst combination was a warm May and June followed by a cool July and August.

The incubator tests of keeping quality consist merely in holding a number of samples of berries from various bogs at a temperature well above that of ordinary storage in order to "speed up" the processes of ripening and decay and to bring out any inherent weakness.

Separate Forecasts for Two Varieties

Separate forecasts are made for the two principal varieties and are issued about the time each variety is being harvested. The forecasts are printed in a local paper which reaches a large percentage of the cranberry growers. These forecasts are published not so much for the guidance of the industry as to enable all interested to follow the course of the work. It is fully understood that the work is experimental and that the forecasts deal merely with the condition of the fruit at harvest time. Even fruit which was unusually sound at picking time may show up badly on the market as a result of unusually severe storage, shipping, or market conditions.

Since the work was begun five forecasts have been made and the subsequent behavior of the crops observed. All but one of the forecasts proved to be correct, and the remaining one was right for one of the major varieties but wrong for the other. This is considered a better average than could have reasonably been expected in so new

a field. Considering the complexity of the problem and our very limited knowledge of some of the factors involved, it is doubtful if so high an average can be maintained in the future.

NEIL E. STEVENS.

CREDIT Problem in Cotton States Has Several Aspects

The heavy losses that local credit merchants suffered in 1920 marked the beginning of a reduction in the amount of credit they extended to southern farmers. They became unwilling to assume on such a large scale the risk of credit sales, the profit of which depended upon the uncertain value of the growing crop; and they were unable to secure any longer the same volume of credit from wholesale dealers and local banks.

The desire of the local merchants to get on a cash basis is as strong as ever to-day. Almost without exception, merchants in selected areas in five cotton States, interviewed by representatives of the Department of Agriculture, wished to eliminate their credit business. Even in the four-year period from 1923 to 1926, it appears from an analysis of the statements of local merchants in two representative sections of Arkansas and Oklahoma that their losses on credit sales to farmers exceeded their interest charges. They are apparently losing money on their credit business in these areas in spite of the high rates of interest they charge.

How will the farmers be able to get along with less merchant credit? It is possible that the curtailment of this kind of accommodation, in spite of the temporary hardship involved, will have some desirable effects. It will require the cotton grower to do without an expensive type of credit which does not generally increase the profitability of his farming operations. Many growers may be able to save a larger part of their earnings in good crop years and dispense with a part or all of the merchant credit which now costs them 10 to 60 per cent interest or more. Others may find it advisable to raise on the farm a larger proportion of the food and feed stuffs they need. In these ways, farmers can reduce that part of the credit which is used to least advantage whether it comes from banks or from merchants. Incidently, this course would help to make them independent of creditors who sometimes impose burdensome requirements as to the production and marketing of their crops. It would leave them more free to sell through cooperative marketing associations.

It is often said that one of the greatest needs of the cotton grower is to obtain credit so that he can hold his cotton for the best price rather than dump it all on the market at ginning time. Regardless of the economic soundness of this policy, to what extent is the credit situation responsible for the early sale of the crop? How many farmers sell their cotton as soon as it is ginned, and what are their real reasons for so doing? To what extent can it be explained by their debts and their inability to secure renewals?

Questionnaire as to Selling

In reply to a questionnaire sent out in December, 1926, to cotton growers in 10 States, 3,431 gave information as to the marketing of

the 1926 crop. Two thousand, six hundred and thirty-nine of these, or 77 per cent, reported that they had marketed their crop as soon as it was ginned, and of those who sold from the gin 978, or about 37 per cent, gave their credit obligations as the reason. Local surveys in North Carolina, South Carolina, Georgia, and Arkansas made in the spring of 1927 show that out of 544 farmers interviewed, 455 (or 84 per cent of all) sold their cotton as fast as it was ginned. Of these 455 growers, 56 per cent sold early because they expected to obtain a better price by so doing, or considered holding an unwise policy; 27 per cent sold because they had debts to pay at that time; and 17 per cent sold for both reasons. In other words, 73 per cent of the farmers in the areas covered by these surveys would have sold their cotton as soon as ginned in the fall of 1926 because of price considerations, even had they been free of debt. The other 27 per cent would have held their cotton longer had they been free of debt or able to secure renewals. Some of these would doubtless consider it bad policy to hire credit as a means of holding cotton; but probably a substantial number would have held it had they been able to renew their production loans.

One must bear in mind, in interpreting these figures, the unusually rapid decline in the price of cotton throughout the early fall of 1926 which may have created a panicky situation peculiar to that year. Even in times like these, however, the credit situation would seem to prevent the holding of cotton by a substantial number of growers who do not wish to sell.

Credit for Buying Livestock

Such data as are available concerning the problem of supplying credit for desired diversification programs are based on studies of selected areas in North Carolina, South Carolina, Georgia, and Arkansas, in the spring of 1927. These inquiries indicate that out of a total of 638 farmers, 271 or 43 per cent, wished to make some change in their farming operations. The predominant desire, as expressed by 72 per cent of these farmers, was to increase the number of their livestock, to raise more feed crops, or to build barns or fences to care for additional stock. One hundred and thirty-nine farmers, or 51 per cent, reported that they would need credit in order to make the changes they desired. Of these needing credit, again, 65 or 47 per cent thought they would be able to obtain the necessary credit from local banks, credit corporations, merchants, or individuals.

With due allowance for the abnormal cotton situation of 1926, these results indicate the presence of a problem which is probably in part one of providing suitable credit facilities for the purchase and care of livestock. Fifty-three per cent of the farmers needing credit for these and other changes were doubtful of being able to secure it. Many of these may be mistaken about the advisability of making the change; others may prove to be incapable of carrying it out with a profit. Some of them would undoubtedly be able to make profitable use of the credit they need but they anticipate difficulty in securing loans, because of a scarcity of loanable funds in the community. The fall in the price of cotton in the autumn of 1926 was a hard blow to credit agencies, since farmers found it difficult to liquidate their outstanding debts. In many areas, particularly in

Georgia and South Carolina, bank failures were often responsible for a lack of credit. Sometimes there is a scarcity of local savings, however, which makes it difficult even in normal years for banks to meet the legitimate demands of customers. Ways of drawing in adequate supplies of outside capital from the financial centers of the country (as through the intermediate credit system) frequently remain to be found.

The problem, then, of financing profitable changes in methods of farming in the South is threefold: (1) It is a problem of determining what changes are really advantageous and spreading throughout the rural community a practical knowledge of profitable farming methods; (2) it is a problem of selecting good risks, of extending credit judiciously to those farmers who have the necessary ability; and (3) in regions where the local supply of loanable funds is inadequate it is a problem of finding suitable means of attracting outside capital at reasonable rates of interest and in sufficient volume to satisfy the legitimate credit needs of the community.

ARTHUR N. MOORE.

CREDIT Study in the Southeast Reveals Shift to Cash Loans Recent investigations in the Cotton Belt indicate that the credit practice of the farmer in many sections is undergoing changes which have an important bearing on the farmer's operations and on the institutions which provide him with credit.

Reports from over 4,000 farmers in 1926, three-fourths of whom were owners, showed that the average amount of short-term credit used per farm in 10 cotton States was about $340. The farmers of Tennessee reported the least credit, with an average of $200; the greatest amount was $550, used in South Carolina.

These amounts represent averages for all farms. Only 71 per cent use short-term credit in the form of cash loans or merchant credit, or both. Tenants are more generally the users of credit than are owners, having had loans in 86 per cent of the cases as compared with 68 per cent for owners. The size of the average tenant loan is about 25 per cent smaller than the loan to the owner.

The amounts of short-term funds borrowed by southern farmers appear to be increasing. Studies in 1921 and 1922 covering over 1,600 farms in Tennessee, North Carolina, and Georgia, showed an average amount of all merchant and cash credit per farm of $213. In 1926 statements of over 1,000 farmers in the same States gave a corresponding total of $284, exclusive of about one-third that amount carried over from the previous year.

Borrowing to Buy Fertilizer

Expenditure for fertilizer usually appears as the principal purpose in borrowing in the Southeast. This item constituted 48 per cent of the total credit in 1923 and 53 per cent in 1926.

In the sections studied local banks supplied 66 per cent of the cash credit in 1926 and agricultural credit corporations about 17 per cent. The increased amounts of credit which are now required, and the swing toward a cash policy by merchants and fertilizer companies have increased the demands upon the local banks and other credit

institutions. The wide difference between time and cash prices on fertilizer since 1923 has caused a marked increase in the number of applications for cash loans. Requests for such loans have in many cases brought the demand beyond the capacity of local banks to supply and has led some banks to adopt a policy of not extending fertilizer credit. This class of loans is undesirable for many banks because it requires the withdrawal of large amounts of funds early in the spring with no offsetting receipts until fall.

Despite this increased use of credit, the total cost of borrowing has probably not risen materially, if any, because of a lower average of credit costs resulting from the substitution of cash loans for merchant credit. The 1923 studies in the States mentioned above showed 29 per cent cash credit and 71 per cent merchant credit, whereas the 1926 inquiry in these States showed 62 per cent cash credit and only 38 per cent from merchants.

Cost of Cash Loans

Resulting economy from this change in source of credit is evident from the 1926 studies in South Carolina and Georgia which showed that the weighted average credit cost for cash loans in those States was 9 per cent a year, while the average cost for merchant credit was 28 per cent a year. A considerable part of the high charge for merchant credit is due to the purchase of fertilizer at time prices often 25 per cent above cash prices. Should farmers of these States succeed in establishing credit conditions which permit the extension of credit at lower costs per dollar than the present average rate of 13 per cent, they would increase proportionately the average amount of funds that could be obtained for the same total outlay.

Whether the farmer is in a better position because of these changes depends upon the use of the proceeds of loans secured. He has gained from a lower rate and from improved credit standing wherever closer conformance to commercial practices has permitted cash borrowing. He has lost wherever the increase of credit has been used for farming operations or other purposes which have not returned the amount of the advance and so has remained as a debt.

Operating Capital Usually Small

The southeastern part of the United States is noteworthy because of the relatively small amount of operating capital in the form of livestock, machinery, and other equipment used to supplement the labor of the farm operator. A wise application of credit for such purposes is to be encouraged as an aid to increased production and increased income.

The greatest care is needed in selecting the objects for which debt is to be incurred. The average year's operations should return the entire principal of the loan plus interest and other charges. Unless the farmer can make his use of credit improve his position over the alternative course, he will do better to restrict his borrowing even though he might be able to secure credit at a low cost. This caution in the use of additional funds is the more necessary in view of the fact that the net return from most farms is not equal to the current interest rate on the amount invested.

DAVID L. WICKENS.

CROP Reports in United States Made Impartially, with Farmers Cooperating To many people the Government crop reports are a thing of mystery. Comparatively few people have any idea of the vast amount of work and care involved in the making of a crop report. The official reports of the Department of Agriculture now cover about 74 crops and practically all classes of livestock. Reports are issued monthly thoughout the year.

The basic information upon which all of these crop and livestock reports are built is furnished by farmers themselves. Nearly 300,000 voluntary crop correspondents, over 90 per cent of whom are farmers, are enrolled in the crop-reporting service. These men serve without compensation, except for certain bulletins and reports which are sent to them. Many have been reporting for more than a quarter of a century; a number have been reporting for nearly 50 years. Many of these men take great pride in furnishing thorough information and go to considerable trouble to gather the facts.

These crop correspondents are divided into groups, and for all of the important crops information is gathered from separate groups in order to check one lot of information against the other. Some of these correspondents report direct to the Washington office and some of them to one of the 41 field offices of the division. Each of these offices is in charge of a trained agricultural statistician, and in the larger States from one to three assistant statisticians are also employed.

Questionnaires to Correspondents

Each of the field offices maintains a corps of correspondents to whom questionnaires are sent from time to time. The statisticians and their assistants are required to travel throughout their States during the growing season to familiarize themselves with the conditions and to furnish to the Washington office the accurate information concerning the situation at any given time. The information gathered by the field offices is summarized and sent to Washington a day or two in advance of each report. The information secured direct by the Washington office is tabulated in Washington and used as a check on the information furnished by the field offices. It sometimes happens, but very infrequently, because of failure of mail to arrive, that the reports received direct in Washington are the only source of information for the making up of a particular report.

All of the issued reports are prepared by a crop-reporting board composed of a chairman and from five to seven members who are nominated by the Chief of the Bureau of Agricultural Economics and approved by the Secretary of Agriculture. The board is made up of one to three members of the Washington staff; the remaining members are composed of agricultural statisticians in charge of field offices, from three to four of whom are called in each month to assist in making the report. During the year statisticians from practically every State are called in to act as members of the board.

Factors in Making Reports

In the making of a crop report, two important factors must be considered. First comes the acreage. A preliminary estimate of the acreage planted to various crops is made as of July 1. These estimates

are used throughout the season unless there is reason for change because of heavy abandonment. In the case of cotton, an estimate of abandonment is made as of September 1. The estimates of acreage are based on reports from many thousands of farmers who report the acreage for their own farms. In some States where an annual enumeration is made by the assessors, the results of these enumerations are used, and recently a crop meter has been devised which is used to measure the linear feet of each kind of crop along selected highways. The measurements for the current year are compared with measurements along identical routes the preceding year.

The second factor is the condition or probable yield. Up to harvest time this is based on condition reports. Correspondents are asked to estimate crop prospects on the basis of percentage of a normal crop, a "normal" crop or "full" yield (represented by 100 per cent) being defined as that yield which is expected when the season is favorable and insects and diseases have caused little or no damage. The indicated yield is worked out mathematically by a study of the relation of condition to yield in previous years. For example, if the five-year average condition of wheat for a given State on July 1 were reported as 70 per cent of normal and the five-year average yield for the same period were 14 bushels, a 100 per cent condition would be 20 bushels, or 14 divided by 70. The "par" (or 100 per cent yield) would be 20 bushels.

Precautions Against "Leaks"

Extreme precautions are taken to prevent anyone not connected with the service from securing advance information as to what any particular report will be. All of the reports from the field offices covering important crops are sent direct to the Secretary of Agriculture where they are placed in a locked box awaiting the morning of the day when the report is to be released. On January 1 each year the Secretary issues a series of regulations which fix the date and the hour that each report will be released throughout the year.

On the morning of the day the report is to be released, the chairman of the crop-reporting board, with one or two members, goes to the office of the Secretary of Agriculture, frequently as early as 4 or 5 a. m. Here they are given the reports received up to that time from the field offices. These reports are carried back to the rooms of the crop-reporting board under guard, and as soon as the reports reach the room the doors are securely locked. On the evening before, all of the telephones and buzzers are disconnected in the board room and the windows are securely covered with opaque glass and sealed, so no one can give signals to the outside. Under no consideration is anyone permitted to leave the crop-reporting board room.

Last-Minute Procedure

About 15 minutes before the time of the release the Secretary of Agriculture is admitted to the rooms to review and approve the report. About two minutes before the time set for the release, the chairman of the board with one or two members and the Secretary of Agriculture leave the room under guard and go to an adjoining room, where a number of telephone and telegraph instruments are installed. As soon as the chairman enters the room all of the news-

paper men and others present are requested to get inside of a white chalk line about 3 feet from the instruments. The chairman of the board places a copy of the report face down at each instrument, and exactly at the minute and second set for release the signal is given. Each newspaper man or other reporter rushes to his instrument and thus the information is telephoned or telegraphed to all parts of the country.

The cotton report is the only one which is released during trading hours. All the other reports are released after the exchange is closed. To prevent confusion, the cotton exchanges close 5 minutes prior to the release of the report and do not reopen until 15 minutes after its release. On the morning following the release of the report a summary of it is usually to be found in all important newspapers throughout the country.

W. F. CALLANDER

CROTALARIA Pays in Soil Improvement on Sandy Southern Land One of the greatest needs for poor soils and especially the sandy lands of the South is a vigorous legume that can be used for soil improvement. Fortunately, there are plants of this sort, and these are used to a limited extent. Velvet beans, cowpeas, and beggarweed are all good green-manure crops, but there is perhaps none that exceeds in quantity of organic matter produced and in ease of culture certain species of crotalaria The crotalarias are mostly tropical and subtropical annuals, though a few of the smaller species are natives of the Southern States. They are killed at a temperature of 28° F.

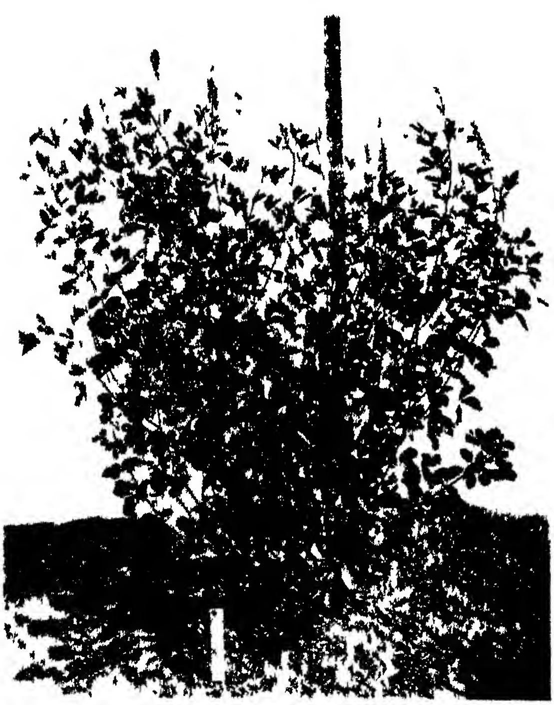


FIG. 62.—A single plant of *Crotalaria striata* in bloom

Of all the species tried during recent years by the United States Department of Agriculture, in cooperation with the Florida Agricultural Experiment Station, those giving most promise are *Crotalaria striata* (fig. 62) and *C. sericea*, and of these the first mentioned is now being used by many orange growers and farmers in Florida. *C. striata* has three-parted leaves, while those of *C. sericea* are one bladed. Both have yellow flowers. It

is not yet known how far north *C. striata* will be useful, but it can possibly be used as a summer green-manure crop as far north as South Carolina.

In Florida the planting of crotalaria may be done at any time, but preferably before March 15. In bearing orchards planting should be done in rows so that early cultivation need not be stopped. The plants may be cut two or three times in a season and the cuttings left on the ground to be turned under in winter.

Valuable on Florida Sands

Crotalaria offers great promise for the improvement of the poor Norfolk sands so common in Florida, especially on the central ridge of the State. It does well on the poorest sands, while beggarweed will not thrive unless a crop of crotalaria has first been turned under. On these poor sands in Florida a profitable rotation can be established after crotalaria has been allowed to produce seed before being turned under. Corn can then be planted in March and the volunteer crotalaria allowed to grow after the corn is laid by in July. A heavy growth carrying enough seed to reproduce will result and may be turned under in November, to be followed by a winter crop of oats, thus giving two cash crops in one year with a green-manure crop to maintain productivity. In 90 to 100 days during midsummer, when all regular farm crops have been laid by, crotalaria will make a heavy growth and add a large quantity of nitrogen to the soil.

Seed may be sown at from 5 to 20 pounds per acre. When heavy seedings are made the hay will be finer and the yield greater, but thin seedings produce most seed. For getting a start a seeding of 5 or 6 pounds is quite satisfactory, as the seed produced will be enough to reproduce a heavy stand and leave a large quantity to be harvested. *Crotalaria striata* begins blooming in about 60 days from sowing, but produces seed irregularly through the season, while *C. sericea* blooms later but seeds more uniformly.

Amount of Nitrogen in Crotalaria

The quantity of nitrogen found in a crop of crotalaria has been found to vary from 83 to 207 pounds per acre. When the growth is turned under after seeds have ripened, the plants decay slowly and hence furnish nitrogen over a longer period than when the plants are turned under young. More organic matter and nitrogen are produced by crotalaria than by most legumes adapted to these sandy soils of the extreme South.

The hay of *Crotalaria striata* has been used, but its value is as yet uncertain. As a soil improver, however, it amply pays its way.

A. J. PIETERS.

DAIRY and Poultry Storage Figures Aid Farmers and Buyers

It is upon current production of butter and eggs that current demand for these products is largely dependent for supplies. But production varies considerably at different seasons of the year, whereas demand is a more constant factor. This fact has caused the storing of both butter and eggs to become an extensive practice. Each year vast quantities of both products are carried in cold storage from the season of heavy

production to the season of lighter production. The production of butter in the United States now approximates a billion and a half pounds annually. The total quantity in cold-storage warehouses at the peak of the storing season on September 1, 1927, was 163,000,000 pounds, equivalent to more than one-tenth of the total year's production. There are no adequate measures of egg production, but peak holdings of eggs during the past few years have been close to 10,000,000 cases.

After goods are placed in cold storage they remain a part of the supply. They may be used at any time to supplement that part of current production which moves directly into consumption. It is therefore as important for the producer and the distributor of butter or eggs to be informed about the storage situation as it is to be informed about production. The primary purpose of storing is to prevent shortages during periods of light production, and many operators store for that reason rather than for speculation, but such operations obviously have a speculative angle since there is no certainty regarding the time when goods will be removed. Removal depends upon various factors, such as the cost of the goods when stored, later price changes which determine when profits may be realized, and the willingness of storage operators to seek greater profits through holding for anticipated price advances.

The furnishing of information regarding storage reserves was first undertaken by the department some 10 years ago when a system of reports on quantities of butter and eggs in store as well as numerous other commodities, was inaugurated. These reports were at first on a monthly basis. Monthly reports, however, failed to afford the industries concerned the full protection needed, because during the interval between the release of monthly reports vast quantities of goods moved into or out of storage. The storage movement of butter during an active month has frequently exceeded 40,000,000 pounds. Changing markets during such periods always make for great risks. It is thus obvious that frequent reports are helpful.

Storage Reports Increased

When branch offices of the former Bureau of Markets were established in several of the larger butter and egg markets during the war, arrangements were made for daily storage reports covering local movements. In 1924, these arrangements were extended to include prompt weekly reports covering a larger number of storage centers. With respect to dairy and poultry products, daily reports are now available showing complete storage movements in 10 important markets. Weekly reports cover a total of 26 markets, and the monthly report previously mentioned includes all warehouses in the United States. Cities selected for the weekly report represent not only various geographic sections, but also include points at which the bulk of total United States stocks are stored.

Daily reports contain information regarding storage movements of the previous day, and weekly reports issued each Monday indicate stocks on hand the previous Saturday. Monthly reports can not be placed on such a timely basis because they include all warehouses in the United States, large and small, but the usual release date is not later than the twelfth of the month, at which time the stocks for the first of the current month are reported.

That the more frequent releases have done much to take the guess work out of storage statistics is evidenced by the fact that prior to the monthly release many private individuals, firms and trade organizations now make estimates of total United States stocks with the weekly reports as a basis. In many cases this is done with remarkable accuracy, and the monthly release frequently is regarded principally as a confirmation of trade estimates. Sucessful estimating, of course, is more than a mere mathematical process. In order to make accurate estimates, changes must be noted which are known to have occurred, such as earliness or lateness of season, or the adoption of new merchandising methods on the part of producers or shippers whereby marketing is more direct, resulting in more or less storing at interior warehouses.

Reports Benefit All Concerned

Storage statistics are of value to all branches of the dairy and poultry industries. Many producers do not make a direct use of any statistics, because they do not know how, or because their cooperative association is marketing their product, or because they are willing to let others do their thinking. But even though the individual producer may not use statistics, some one between the producer and the market will use them. It may be the manager of the cooperative association or the independent dealer. Statistics are thus indirectly of value to the producer since their use by marketing agencies tends to keep supply and demand in a consistent relation to each other. Statistics afford the producer an opportunity to understand price changes. They can also be used to aid producers in adjusting production policies. Many producers have so shifted their breeding or feeding programs as to realize heavier production during those parts of the year when market supplies are ordinarily lowest and prices are ordinarily highest. Such adjustments must be made in advance. Among the principal factors upon which producers may rely in making their plans is an intelligent use of basic statistics. However, the producer or distributor who uses statistics, must interpret them in the light of his own business.

LEON M. DAVIS.

DAIRY Associations to Improve Herds Increasing Rapidly In 1906, when the first dairy-herd-improvement-association work was started in the United States, the most optimistic and far-sighted dairymen would not have prophesied the great growth in numbers, in development, and in the effect which these associations have had in this country. Little did the 31 original members realize that in 22 years' time their numbers would be increased to over 23,000, and the number of cows from 239 to over 414,000.

Such, however, has been the progress of the work. It has been unmarked by any setbacks except for the years during our participation in the World War when it was extremely difficult to get competent testers for these organizations. Table 5 shows the growth in numbers of associations from 1906 to 1928.

TABLE 5.—*Growth in numbers of associations from 1906 to 1927*

Year	Number of associations	States represented	Year	Number of associations	States represented
1906	1	1	1920	468	36
1910	40	11	1925	732	38
1915	211	25	1928	947	40

Figure 63 shows the location of the 837 organizations on January 1, 1927.

The modest program attempted by the pioneers of this movement in the United States was "to promote the dairy interests of its members, and particularly to provide means and methods for testing the milk of the cows of the members periodically." The tester made his regular monthly visit to each member as in the present-day

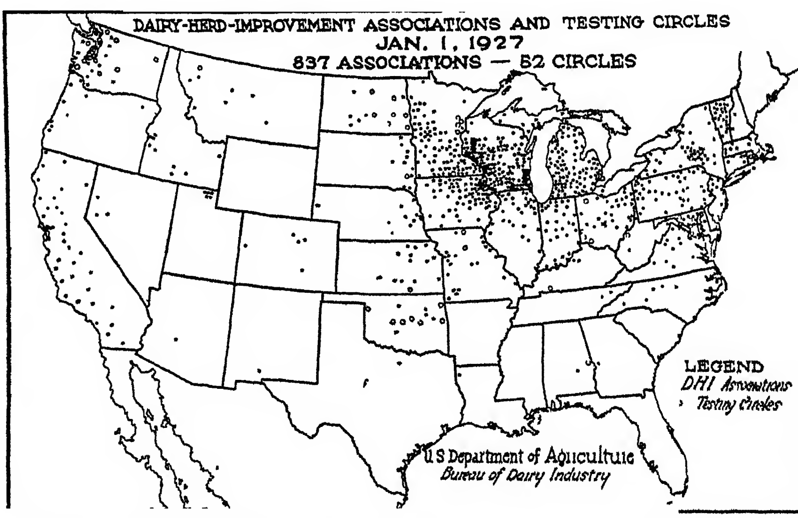


FIG. 63.—Location of dairy-herd-improvement associations in United States on January 1, 1927

organization. The primary purpose of testing was to develop herds of economical production by locating the profitable cows and furnishing information which would enable the members to weed out from their herds those animals not producing milk and butterfat economically.

Scope of Work Broadened

In the main the goal of the dairy-herd-improvement association to-day is the same as that of the early association. The scope of the work has been broadened, however, by means of studies of operation of individual associations, analyses of the records, and herd studies. It has been found that the greatest efficiency in milk production can not be derived from selection alone. Selection is a fundamental factor of herd improvement, but it needs to be supplemented by proper feeding practices, effective herd management, and better breeding. All of these principles are brought into play by the competent tester of to-day.

The best test of the efficiency of these associations is to find out whether they have accomplished their purpose: the building up of production and economy of production. Studies of records of individual cows have shown that increase in production is usually accompanied by an increase in the economy of that production. The following data show the increases that have been made.

The first association in 1906 with 239 cows had an average production of 5,336 pounds milk and 215 pounds butterfat per cow. By 1910, after four years' testing, the production was 6,170 pounds milk and 264 pounds butterfat. This increase in production per cow was accompanied by an increase in income over feed cost from $20.99 per cow to $40.44.

In spite of the organization of new associations, many of them with low producing herds, the average production per cow in the dairy-herd-improvement associations in this country is steadily increasing, as shown in Table 6.

TABLE 6.—*Average milk and butterfat production of cows in dairy-herd-improvement associations from which records were received by Bureau of Dairy Industry (1920–1927)*

Year	Associations	Cows	Milk production	Butterfat production
	Number	*Number*	*Pounds*	*Pounds*
Prior to 1920	120	21,234	6,077	248
1924	105	25,850	7,060	279
1925	371	96,102	7,257	286
1926	409	108,312	7,322	288
1927	426	116,908	7,410	295

Dairy-herd-improvement associations are rapidly growing in numbers, in members, and in herds on test. They are accomplishing the result for which they were inaugurated—greater production per cow with an increased economy of production. Considering the remarkable results already accomplished, who can predict the effect of these associations during the next 10 years?

JOSEPH B. PARKER.

DAIRY Bulls Should Be Chosen for Ability to Raise Herd Income When selecting a dairy bull, every breeder and dairyman should take into consideration the ability of the animal to increase the production of his herd. The surest way of selecting a bull that can do this is to choose one that has already demonstrated his ability to increase production when mated with cows of equal or higher production than the cows in the herd in which he is to be used. In a few years, when his daughters begin producing, such a bull will greatly increase the income from the herd.

Investigations carried on by the department show that in one district a purebred dairy bull was mated with cows that averaged 489 pounds of butterfat a year. Six of his daughers averaged 675 pounds of butterfat a year. This was an average increase of 186 pounds, or of 1,116 pounds for the six daughters. At 40 cents a pound for butterfat the total value of this increase is $446.40. This means that with the same number of cows, and with no greater cost except slightly

more feed, these six daughters return a yearly income of $446.40 more than their dams.

If the dairyman selects a bull that does not have the ability to increase the production of his herd, succeeding generations of heifers may be such poor producers as to reduce the income so greatly that discouragement and even failure may result. A purebred bull of the same breed and in the same district as the bull mentioned above was mated with cows that averaged 499 pounds of butterfat a year. Ten of his daughters averaged 280 pounds of butterfat a year. This was an average decrease of 219 pounds, or 2,190 pounds for the 10 daughters. At 40 cents a pound for butterfat the yearly loss amounts to $876.

It is a comparatively simple matter to increase the production of dairy herds through the use of purebred bulls when the herd average is 300 pounds of butterfat or less a year per cow. As production increases from 300 to 400 pounds of butterfat, it becomes more and more difficult to find bulls that will increase production; and when the herd average is above 400 pounds of butterfat per cow, only about one-half of the bulls studied by the Bureau of Dairy Industry were able to increase the production of their daughters over that of the dams of the daughters.

Results from 200 Purebred Bulls

A study of 200 purebred dairy bulls each having five or more daughters whose yearly milk and butterfat records could be compared with the yearly milk and butterfat records of their dams showed that of 9 bulls which were used in herds where the dams averaged yearly 200 pounds or less of butterfat, every one increased the production of the daughters over that of the dams of the daughters. Out of 49 bulls which were used in herds that averaged between 200 and 300 pounds of butterfat, 44 increased and 5 decreased production. Of the 85 bulls used in herds that averaged from 300 to 400 pounds of butterfat, 57 increased and 28 decreased production. Out of 57 bulls used in herds that averaged 400 pounds of butterfat or over, 28 increased and 29 decreased production.

These figures show that it is only the best class of purebred bulls that are capable of materially increasing production in high-producing dairy herds. There is little hope, then, for herds in which grade and scrub sires are used. Since only one-fourth of the dairy bulls are purebred, the first great forward movement in dairy-herd improvement is the elimination of the scrub and grade sire. The second step is the elimination of all inferior purebred sires. And the third and final step is the general use of good, proved bulls, that is, bulls that have already demonstrated their ability to increase the production of a high-producing dairy herd.

W. E. WINTERMEYER.

DAIRY Cattle Studies Indicate Effect of Feeding on Growth What is the normal weight of a cow for a given age? From a survey of dairy literature on this subject, it appears that average weights obtained in the course of feeding trials have been regarded as indications of normal growth. This method of judging growth has probably been

due to the fact that weight data are more readily obtained than measurements of stature. In connection with the breeding projects carried on in the Bureau of Dairy Industry experimental herds, it has been possible to obtain additional information on this problem. Many weight records have been studied in an effort to discover to what extent the gains made prior to maturity follow a definite principle or law of growth.

Although organisms, whether plant or animal, apparently gain at different rates during the various stages of their growth period, yet the changes are consistently uniform and usually the growth trend follows a typical curve.

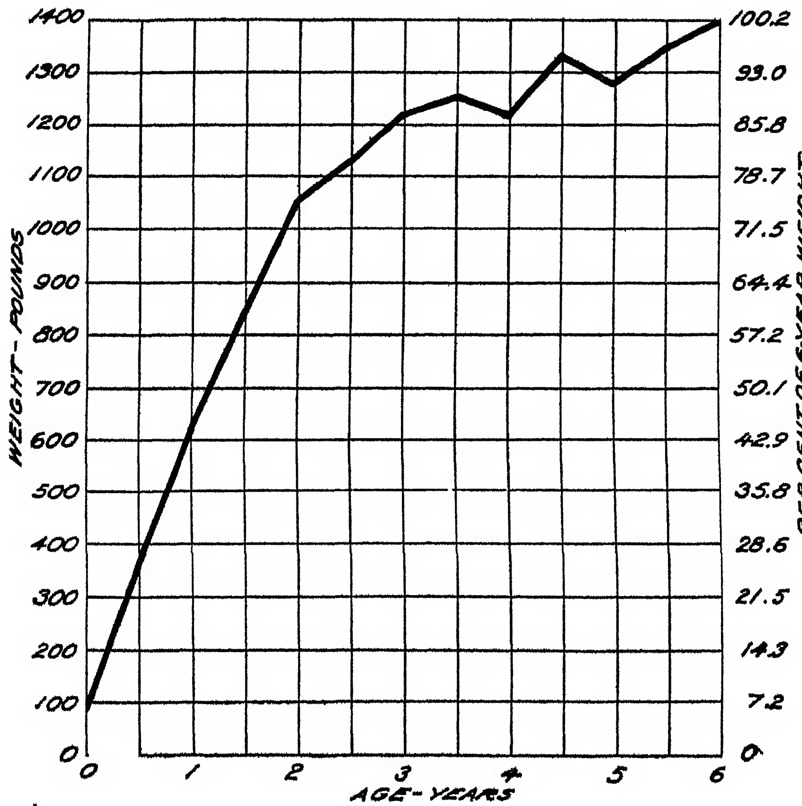


FIG. 64. Average weights for the first six years of life of Holstein heifers at the experimental farm of the Bureau of Dairy Industry, Beltsville, Md.

In Figure 64 the average weights of Holstein heifers in the experimental herd at Beltsville, Md., have been plotted over a growth period of six years. The number of animals represented vary in number from 28 to 7. An independent study has been made of the 7 animals upon which weights were obtained throughout the six years, and no outstanding difference was observed between their weight trend and the one on the mass population. Assuming that there is no hereditary check on growth, the curve in Figure 64, therefore, may be regarded as a reliable index of the weights which can be attained by Holstein cows grown under conditions of feed similar to those provided at Beltsville.

During the first year of life almost equal gains were made during each six-month period. These gains amounted to 263 pounds from birth to 6 months and 266.7 pounds from 6 months to the age of 1 year. After the first year the semiannual gains decreased, a perceptible slackening of the rate of gain taking place following the age of 2 years. Since these animals were bred between 15 and 20 months of age, it may be inferred that pregnancy was one factor which caused smaller gains.

The breaks in the growth curve as it approaches the horizontal are now a source of investigation. Presumably these changes in growth are the result of calving. The curve indicates, however, that when a loss in weight took place it was only temporary and not more than 54.4 pounds on the average for a six-month interval.

Animals Still Increasing at Six Years of Age

It is of especial importance to note that at 6 years of age the animals were still increasing in weight. There is reason to believe that the gains obtained at this age indicated actual growth and not merely a deposition of fat accompanying maturity. Just how long growth can continue in the case of the cow is a matter of speculation. The present data indicate that it may continue beyond the age of six years.

It must be remembered that domesticated animals were used in these investigations and environmental conditions were provided, so that growth would be attained at an economic advantage. Nutritional influences especially have tended to promote rapid growth during certain periods of life.

TABLE 7.—*Average monthly weights of 27 Holstein heifers, at the experiment farm of the Bureau of Dairy Industry, Beltsville, Md., for the first two years of life*

Age (months)	Weight	Gain	Age (months)	Weight	Gain
	Pounds	*Pounds*		*Pounds*	*Pounds*
0	97.2	0	13	662.0	35.1
1	121.3	24.1	14	708.3	46.3
2	154.6	33.3	15	745.4	37.1
3	197.2	42.6	16	776.9	31.5
4	252.8	55.6	17	812.0	35.1
5	302.8	50.0	18	839.8	27.8
6	360.2	57.4	19	880.0	40.8
7	406.5	46.3	20	912.0	31.4
8	460.2	53.7	21	943.5	31.5
9	506.5	46.3	22	982.4	38.9
10	552.8	46.3	23	1,015.7	33.3
11	586.1	33.3	24	1,056.5	40.8
12	626.9	40.8			

The Probable Effect of Milk Feeding

Table 7 gives the average monthly weights of the heifers for the first two years of life. In the experiment carried on by the Bureau of Dairy Industry, about one day after birth each calf was removed from its dam and placed in the calf barn. It was then fed whole milk for two weeks, after which it was gradually changed to skim milk and was kept on a full skim-milk diet after 4 weeks of age. At the age of 6 months it no longer received skim milk.

The table shows that although there were approximately equal gains during each six-month interval of the first year, the probable

effect of milk feeding is an increasing gain in weight from birth to the age of 6 months. After skim-milk feeding is discontinued at 6 months of age there is a decline in the rate of gain. In other words, there is some evidence of the existence of a growth cycle, the maximum of which is reached at 6 months. The fact that monthly increases in weight become less after the removal of skim milk from the ration shows the need for conducting experimental feeding tests for the purpose of determining the effect of continuing milk feeding beyond the age of 6 months.

Several questions demanding solution through research of this nature are suggested by the data. If calves can consume milk for a longer preliminary period, at what age will the gains begin to slacken? Would a delay in the turning of the weight curve toward the horizontal be followed by larger animals at maturity and higher producing ability? Furthermore, would early maturity of production accompany this earlier maturity of growth? Evidence has already accumulated showing that greater gains can be obtained by prolonging the feeding of skim milk for at least several months beyond the initial six-month period, and it is hoped that as further data are obtained, information of an exceedingly practical nature concerning the relationship between longer milk feeding and the promotion of earlier maturity will be forthcoming.

G. W. Hervey.

Dairy Cow Market at South St. Paul Largest in World Located in the heart of one of the most important dairying districts of the United States, the South St. Paul livestock market is the largest distributing center for commercially sold dairy cows in the world. Shipments from that market go into all sections of the United States and into a number of foreign countries. During the past year, for instance, buyers in 22 States ranging from the Atlantic to the Pacific coasts and from the Canadian boundary to the Gulf of Mexico purchased dairy cattle on the South St. Paul market. Foreign countries supplied during that time included Canada, Cuba, and Mexico.

The principal outlet for these dairy cattle is naturally to the larger dairying sections of the Middle West, embracing parts of Minnesota, Wisconsin, Iowa, and Illinois, and a considerable volume of this stock is also sent to the more important dairying regions in the East, particularly those of New York and Pennsylvania.

The volume of this business in dairy cows has shown a steady expansion. During the five-year period beginning with 1922 yearly shipments from the South St. Paul market rose from a total of 27,064 for 1922 to nearly 60,000 head in 1926. The greatest growth began in 1924 when many farmers found that income derived from their dairying was one of their main and most dependable sources of revenue.

In 1922, 27,064 head of dairy cattle were shipped from the St. Paul market; in 1923, 33,843 were shipped; in 1924, 50,761; in 1925, 56,867; and in 1926, 59,361 head were shipped.

Sources of supply for most of these dairy cattle sold at South St. Paul include the dairying areas of Minnesota, North Dakota, and Wisconsin. In these shipments are found stock from some of the best herds in these States. Types cover all grades from the ordinary

scrub cow to the blue-ribboned purebred, but the great bulk of the supply consists of high-grade animals. Breeds represented include all of the standard dairy types and these are offered in about the following order: Holstein, Shorthorn, Guernsey, Jersey, Ayrshire, and Brown Swiss. A considerable number of crossbreds are offered.

All cattle sold for dairying purposes on this market, for shipment either interstate or intrastate, are required by both Federal and State laws to undergo the tuberculin test. This test is given under the supervision of the United States Bureau of Animal Industry, in

FIG. 65.—Load of dairy cows shipped from South St Paul market

cooperation with the Minnesota Livestock Sanitary Board, and assures the purchaser that he is obtaining animals which are free from tuberculosis.

C. A. MARZOLF.

DAIRY Cow's Output Usually Not Limited by Eating Capacity For many years the idea has prevailed that one of the reasons for low production of the dairy cow is that she is unable to consume sufficient food to provide for a large quantity of milk and butterfat, or, in other words, that a cow's production is limited by her ability to consume a sufficient quantity of food nutrients. A study of this relation was made with the production and feed consumption records of 55 purebred Holsteins and 45 purebred Jerseys that have completed yearly official tests in the herd used for experimental breeding investigations in the Bureau of Dairy Industry at Beltsville, Md.

As far as possible, these cows were tested under the same conditions, all influencing factors thus being eliminated except the factor of inheritance for production. The cows, however, were tested under

such conditions as to permit the maximum production of their hereditary capacity. They were fed according to their requirements for the quantity of milk they produced and for the maintenance of their body weight. At least 10 per cent in excess of the standard requirements was fed in order to avoid any possible check, from a nutritive standpoint, to the production of their maximum amount of milk and butterfat. Every 15 days the ration was adjusted to the requirements of the cows. The animals were kept in box stalls and were milked three times a day throughout the year. The feeds used were alfalfa hay, corn silage, soaked dried-beet pulp, and a grain mixture with approximately 18 per cent of digestible protein. No pasture was allowed during the year while on test, in order that it might be possible to determine the exact quantity of feed consumed.

Feeding Capacity and Production

Among these 55 Holsteins and 45 Jerseys were animals representing a variety of types. Yet when curves were plotted showing their production, feed requirements, and feed consumption from month to

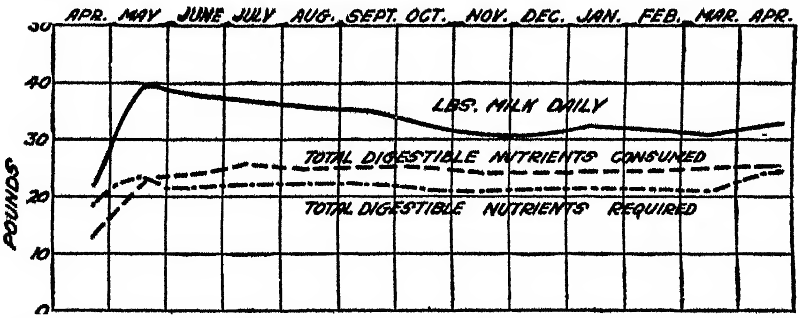


FIG. 66. Comparison of milk production, feed requirements, and feed consumption of Mabel's Mary Jane 457186; age 5 years, 1 month, 20 days; milk production 12,227 pounds, butterfat production 632.76 pounds; bred November 24

month, it was shown that with very few exceptions these cows were able to consume more nutrients than the feeding standards indicated were required for their production. Figure 66 compares the milk production, feed requirements, and feed consumption of a representative cow in the dairy herd at Beltsville, Md.

According to the data obtained, ability to consume sufficient feed does not limit the producing capacity of these cows, except possibly in the early stage of their lactation. The majority of the cows reached the peak of their milk flow within 45 days after freshening. During the first 30 to 40 days they usually did not consume sufficient feed to meet their requirements. If a cow is in good flesh she usually draws somewhat on her body reserve to meet the demands of the heavy milk flow during this period. However, it is possible that had these cows been able to consume sufficient nutrients to meet their requirements during this period, they might have reached a higher level of production and consequently have had a greater total production for the year. During the remainder of the lactation period the cows with very few exceptions consumed more than enough nutrients to meet their requirements. Had they not been restricted

to a certain margin allowed over their calculated requirements, the actual consumption might have been considerably increased.

A Scottish investigator[5] states that the stomach capacity of a cow is fairly constant, and that an animal weighing 1,232 pounds can not consume and digest efficiently more than 32 pounds of dry matter per day, and one weighing between 896 to 1,008 pounds can not consume and digest efficiently more than 26 pounds of dry matter per day.

Average Weight of the Cows

The Holstein cows in this study averaged 1,226 pounds in weight and consumed an average of 38.2 pounds of dry matter per day throughout the year, which is 6 pounds of dry matter per day more than the maximum amount claimed by Boutflour. The Jersey cows had an average weight of 910 pounds and consumed an average of 30.88 pounds dry matter per day, an average of almost 5 pounds of dry matter per day more than the maximum amount stated by Boutflour for animals of this size.

The maximum consumption of dry matter per day occurred in the case of a Holstein cow that consumed an average of 66.7 pounds of dry matter per day for a period of 30 days. Her average consumption of dry matter per day for the entire year was 55.7 pounds. This cow had an average weight of 1,409 pounds.

The amount of dry matter that a cow may consume depends on the proportion of grain and roughage fed in the ration. A pound of dry matter in hay or silage would be more bulky than a pound of dry matter in grain. At the Huntley, Mont., station of the Bureau of Dairy Industry, a number of Holstein cows have been on a feeding experiment in which they received only hay, silage, and roots. On this bulky ration they were able to consume an average of 32.8 pounds of dry matter per day for the year.

It is apparent that lack of capacity to consume sufficient feed is not a limiting factor in producing ability to the extent that it was formerly thought to be.

DUNCAN STUART.

DAIRY Export Control Plan of New Zealand Affects U. S. Producer

New Zealand, which was comparatively unimportant 20 years ago as an exporter of dairy products, has come to be the most important single supplier of these products to Great Britain. It is second only to Denmark in the total value of its surplus. Since the number of people in New Zealand is 1,380,000, while the number of dairy cows is 1,303,000, that small agricultural country maintains practically one dairy cow per capita. Accordingly, its highly developed dairy industry is now predominantly dependent upon foreign markets. In the seasonal year ended July 31, 1927, the exports amounted to 148,000,000 pounds of butter and 172,000,000 pounds of cheese. The quantities retained for home consumption probably did not exceed 40,000,000 pounds of butter and 7,000,000 pounds of cheese.

A further condition entering into the New Zealand dairyman's problem is the highly seasonal nature of his production. Somewhat

[5] R. Boutflour, Scottish Jour. of Agr., Vol. IX, No. 1, pp 70-75.

more than three-fourths of New Zealand's yearly production of butter and cheese falls within the six months, October to March, inclusive. The seasonal trend is complementary to that of the United States and other competing regions of the Northern Hemisphere. If the supplies were spread more evenly throughout the year, demand could be better maintained in British markets and the same output could be made more profitable to producers.

An experiment in the extension of cooperative organization to marketing on a national scale has recently been made to promote a more orderly marketing of the surplus of butter and cheese from New Zealand. Fully 90 per cent of the dairy factories were already owned, financed, and controlled by the farmers themselves, but no centralized control existed for marketing. In 1923 the dairy produce export control act was passed establishing a control board whose duties, broadly defined, were to control the export and sale of butter and cheese in the interests of the producers. The act was approved through a referendum vote by a majority of the dairy producers of the Dominion.

The board consists of 2 Government nominees, 9 representatives of suppliers to dairy factories, and 1 person who represents manufacturers of dairy produce. Funds for the administrative expenses of the board are provided by levies on all butter and cheese exported, amounting at present to the equivalent of about 6 cents per 100 pounds on butter and 3 cents on cheese.

Board's Functions Modified

The functions of the board have been modified since its formation. The enactment of the control measure in 1923 gave the board authority to market the produce in any way deemed fit by its members, but absolute control involving the pooling of the produce was not assumed until August 1, 1926, and price fixing has been actually exercised during little more than four months from November 4, 1926, to March 14, 1927. During this period, in order to meet a situation growing out of a complication of abnormal market developments, the board adopted a policy of meeting from time to time through its London agency with a committee of importers of New Zealand butter and cheese for the purpose of naming prices which should be the minimum selling prices for a time. An official statement published by the board made it clear that it had "no intention of interfering with the ordinary process by which economic factors determine the market level of price," but, notwithstanding this declared policy, the opposition to absolute control was successful in forcing its abandonment by the board. On July 23, 1927, the resolution passed in 1926, adopting absolute control over all produce graded as from August 1, 1926, was rescinded.

Orderly Marketing Plan Retained

But the New Zealand control board has not abandoned all plans for orderly marketing. The importance of many of the original activities still carried on by the board is not to be minimized or overshadowed by the defeat of the board's policy with reference to absolute control of marketing. At the annual meeting of the board on July 13, 1927, it was unanimously resolved that its future policy

should comprise the following main planks: (1) Regulation of shipments of produce overseas by adjustments of quantities throughout the season; (2) supervision of loading, unloading, and handling of produce; (3) continuation of collective insurance of all produce; (4) supervision of the cold storage of produce after its arrival in Great Britain; (5) advertising New Zealand produce; (6) aiding in research work affecting the dairy industry; and (7) continued effort toward quality improvement generally.

The activities of the export control board may have an important bearing upon the competitive position of the New Zealand dairy industry. From the point of view of the dairy interests of North America, the regulation of shipments, particularly, will have weight because shipments can be diverted from Great Britain to other outlets to relieve that main outlet from depressing supplies. Aside from the demonstrated saving in the various marketing costs through collective bargaining, the activities under limited control may be expected to improve the quality of the product, to keep a supply continuously available in the markets of Great Britain, and to advertise effectively the relative value of the New Zealand product.

P. F. BROOKENS.

DAIRY Herds Improve With Good Selection, Feeding, and Breeding

In the majority of cases the dairyman himself is responsible for the improvement or decline of his herd. It is true that conditions such as disease and accidents, which are sometimes beyond the dairyman's control, temporarily affect production. In the long run, however, the dairyman can expect a steady improvement in his herd year after year if he follows the simple A B C's of dairying, which are as follows: (1) Careful selection, based on accurate records of production and feed consumption; (2) proper methods of feeding; and (3) better breeding. These are fundamental rules easily applied. If the dairyman is a member of the dairy-herd-improvement association he will have the advice of the tester regarding the application of these practices. Whether or not they are applied, however, depends upon the dairyman himself.

Dairy farmers may be divided into four classes: (1) The deep-thinking group with initiative and determination who study their problems and acquire knowledge of proper practices through reading material and contact with successful dairymen; (2) those who acquire proper practices more or less blindly and are not concerned with the reasons for such practices but follow them because some neighbor has been successful by doing so; (3) those who follow certain practices because they have been the custom of their family or their locality for many years; and (4) those who follow the easiest method without giving any thought as to whether or not it is the best.

The Test of Improvement

The first group, because of the careful study given to the fundamental rules of dairying, and because of the proper application of these rules, bring about a steady improvement in their herds. The test of improvement, in so far as the individual dairyman is concerned, is whether or not his herd is increasing in production with a corre-

sponding decrease in cost per hundred pounds of milk or per pound of butterfat. If his herd is constantly gaining in production and in economy of production, that dairyman is in a sounder position economically than the man whose herd is not gaining.

"Can my herd be built up in production?" is often asked. It not only can be done but has been done by large numbers of dairymen. Definite records of production of herds in dairy-herd-improvement associations where the owners have constantly followed the right principles of selection, feeding, and breeding have demonstrated the feasibility of developing good herds. Some failures have resulted, as may be expected in any enterprise. The successes, however, have far outnumbered the failures and as a whole the members have progressed rapidly.

Records Covering Four Years

Some associations, however, have members who do not follow the methods of the dairymen in Group 1. The records of one association, for instance, are available for four consecutive years. These records are available both for the association as a whole and for the individual herds. The association increased its average production per cow from 5,939 pounds of milk and 292 pounds of butterfat in 1922 to 6,525 pounds of milk and 324 pounds of butterfat in 1925. The income above feed cost per cow also increased from $52.02 to $81.72 during the same period. A study of the records of individual herds, however, showed a difference in results obtained. A comparison of two of the herds over the period of four years is shown in Table 8.

TABLE 8.—*Comparison of two herds in one dairy-herd-improvement association*

Year	Herd A		Herd B	
	Milk production	Butterfat production	Milk production	Butterfat production
	Pounds	*Pounds*	*Pounds*	*Pounds*
First	6,082	355	7,513	397
Second	6,422	317	7,613	407
Third	7,405	416	7,098	390
Fourth	7,905	424	6,084	332

At the end of four years herd A had been developed to a plane of much higher production than that at the end of the first year's test. Herd B, although still a high-producing herd at the end of the four-year period, was, however, a much lower-producing herd than at the end of the first year. There is a possibility, of course, that some factors beyond the owner's control caused such a marked decline as occurred in herd B; but in all probability the owner of this herd did not practice all the fundamental rules which every successful dairyman must follow.

Selection, feeding, and breeding, when properly applied, are the fundamental factors in building up a high-producing dairy herd. No dairyman can afford to neglect any one of them. The dairyman should study his herd constantly, because it is upon him and not upon the herd that the responsibility for improvement rests.

J. B. PARKER.

DAIRY Improvement Associations Test Both Cows and Bulls Dairy-herd-improvement associations, formerly called cow-testing associations, have a twofold purpose: The testing of cows for economical production of milk and butterfat and the proving of sires. In testing cows for economical production, their feed, production, and income

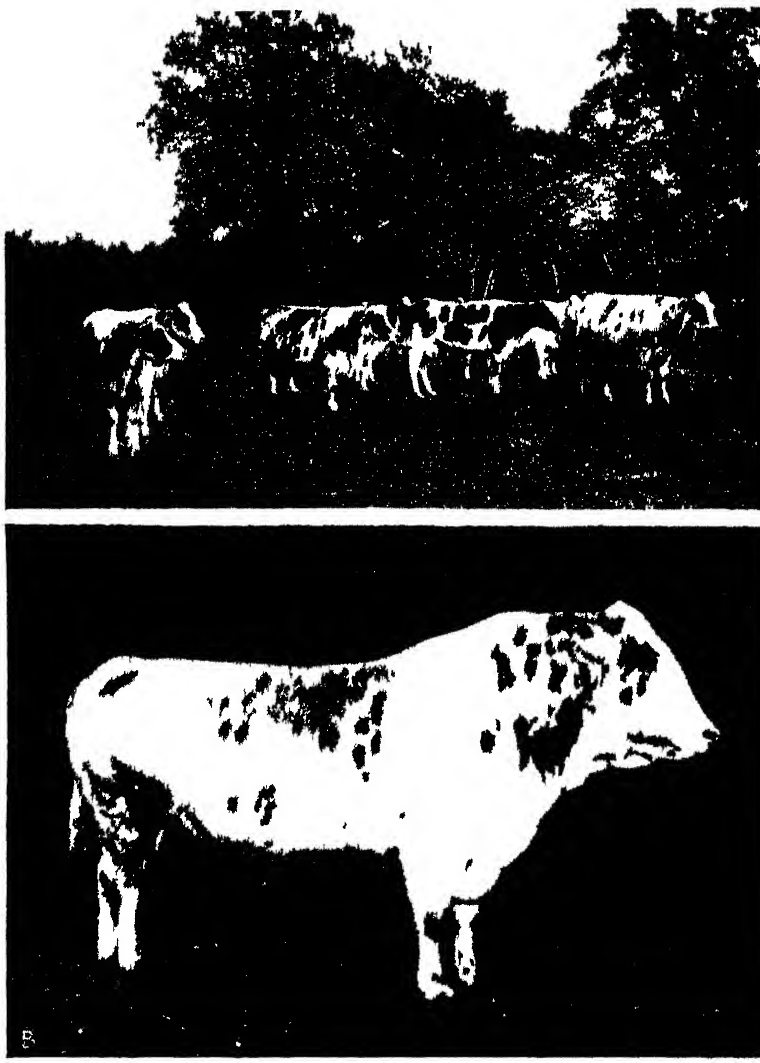


FIG 67.—Results of dairy herd-improvement associations A, Better cows, B better sires

records are determined. Using these records the dairyman is able to cull out the low and unprofitable producers and to feed the remainder of the herd according to known production. To prove the sire the yearly production records of five or more of his unselected daughters are compared with the yearly production records of the

dams of the daughters. Thus the dairyman is able to determine the transmitting ability of the sire.

A study made by the Bureau of Dairy Industry of the yearly records of cows in dairy-herd-improvement associations shows that on account of low production, about one-third of the dairy cows in this country are being kept at a loss; that about one-third yield little or no profit; and that practically all the profit comes from the other third. A comparative study of the production records of the daughters of purebred dairy bulls and the production records of the dams of the daughters shows that about one-third of the sires have daughters whose average production is less than that of the dams of the daughters. Such sires can not improve the herd. In fact, the figures show that the use of such sires is pulling production down about as fast as culling and better feeding methods are building it up. The records also show that another third of the sires have daughters that excel the dams by only a small margin and that the big improvement in daughters over their dams comes from the other third of the sires. The fact that the daughters do not excel their dams in production does not always prove that the bull is inferior, but it does prove that he is not good enough to head that particular herd.

The testing of cows and the proving of sires constitute the twofold purpose of dairy-herd-improvement associations. They take guess work out of feeding and chance out of breeding.

J. C. McDowell.

DAIRY Loss Annually from Low-Grade Milk Runs to Huge Total A veritable "old man of the sea" is perched upon the shoulders of the dairy industry. This encumbrance saps efficiency by causing dairymen a loss of untold millions of dollars each year through low grade milk which is sent to market. This loss is keenly felt by farmers who have had milk rejected by purchasers. Few people, however, realize the stupendous total which aggregates from these individual losses.

About 10 years ago the records of one milk plant showed that annually over 50,000 gallons of sour milk were rejected as unfit for market milk and returned to farmers to be dumped or fed to swine. Another plant in 1926 rejected nearly 8,000 gallons of sour milk from April to October, inclusive. These are not isolated occurrences. Practically every milk dealer throughout the country has had a similar experience.

What then is the entire yearly loss to the industry in the United States due to low-grade milk? In 1926 over 56 billion pounds of milk and cream were consumed in the fluid state in this country. A conservative estimate, based on available data, indicates that the loss to farmers through sour milk amounts to over \$6,000,000 annually in the fluid-milk industry alone. Probably an even larger amount is lost through milk and cream which are not sour but have flavors and odors which render them unsalable. These flavors are often caused by feeds, such as garlic, improperly fed silage, and bitterweed, as well as by careless handling. If there is added to this the unmarketable milk and cream offered for sale to dairy-manufacturing plants, such as creameries, condenseries, cheese factories, and ice-cream plants, the total would amount to at least \$20,000,000 annually. These figures include only material which is

actually rejected. A considerable amount of off-flavored milk and cream is accepted which can not be made into high-grade dairy products. The resulting manufactured products must be sold at relatively low prices, and the returns to dairy farmers are correspondingly low.

No industry, even a prosperous one, can afford to shoulder such a load. If such losses occurred in any other of the giant trade channels of this country, instant steps would be taken to find and correct the trouble. Efficiency experts, factory-management studies, research laboratories, engineers—all would be used to solve the problem.

Progress in Dairy Sanitation

Is this "old man of the sea" saddled forever upon the dairy industry? By no means. His grip is loosening rapidly and he may be shaken off by concerted effort. Two things point to his ultimate elimination. One is the progress already made in dairy sanitation; the other is the fact that the solution of the problem is already pretty well worked out. Great strides have been made in overcoming this waste. It was not so many years ago that sour milk on the breakfast table was a fairly common occurrence. Now one can travel almost anywhere and be assured of purchasing sweet, palatable milk. All this has come about in spite of the fact that the milk supply of this country is much more complex than it used to be. Milk is now transported hundreds of miles to the city, whereas it used to come from closely adjacent territory.

Cleanliness and refrigeration are the only weapons needed to win the struggle. The fundamentals underlying clean milk production have been found to be relatively few and simple. Clean, healthy, carefully fed cows, small-top milking pails, sterilized dairy utensils, and prompt cooling and cold storage will do much toward banishing sour and badly flavored milk and other dairy products.

Many agencies are at work to simplify and stimulate good dairy practices. Government and State organizations, milk dealers, dairy associations, and other agencies are cooperating in the work. Not the least encouraging sign is the attitude taken by some organizations of dairy farmers. These associations are employing men to visit members' farms to aid in correcting defects. Through such organizations, working from the inside, will come much of the future progress of the industry.

ERNEST KELLY.

DAIRY Market Finds Sweet-Cream Butter Gains Public Favor

The custom of permitting cream to sour before churning developed centuries ago, no doubt as a matter of necessity rather than of choice. The separation of cream by gravity, the accumulation of a sufficient amount of cream to make a churning, and the difficulty of maintaining low temperatures naturally resulted in the cream becoming sour before it was churned.

When the factory system of butter making was introduced in the latter half of the nineteenth century, the souring or ripening of cream previous to churning was a custom so well established that the creamery butter maker adopted it as a matter of course. Even after

the factory separator came into general use and sweet milk was delivered to the creamery, this custom was not changed. Indeed the ripening of the cream was such an important step in butter making that the use of a starter, consisting of a culture of lactic-acid-producing bacteria, became a general practice in order that the development of a desirable acid flavor might be assured.

When State agricultural experiment stations were established many of them studied various problems in connection with butter making. In 1889 the West Virginia experiment station reported that the college creamery had established a good demand for sweet-cream butter. The following year the Iowa station reported that sweet-cream butter stored in a cellar kept better than sour-cream butter. In 1892 LeClair of the St. Hyacinthe Dairy School, Quebec, Canada, recommended Pasteurizing sweet cream, cooling it, holding it for three hours, adding 30 per cent starter, then churning it at once. After adopting this practice he obtained fine-quality butter that was very uniform from day to day. He apparently did not, however, determine its keeping quality.

Keeping Quality of the Product

A study begun in 1905 by the United States Department of Agriculture of the influence of acidity of cream on the keeping quality of butter established the fact that butter made from unripened, Pasteurized sweet cream would maintain its fine quality to a high degree during at least eight months' storage at 0° F. Because of this work the United States Navy in 1909 adopted the practice of purchasing each year a quantity of sweet-cream butter to be placed in cold storage and used throughout the ensuing year. This practice is continued. Mortensen, in Iowa Bulletin 207 published in 1922, concludes from his work that ripened-cream butter receives a higher commercial score when fresh but that sweet-cream butter keeps better in storage.

Sweet-cream butter was much criticized by butter manufacturers and dealers because it lacked the high flavor and aroma of ripened-cream butter. For this reason comparatively little sweet-cream butter was made except on Navy contracts until after 1918. In that year the Navy Department purchased over 9,000,000 pounds of sweet-cream butter from more than 100 creameries. A considerable portion of this butter was packed in 5-pound tin cans by a New York butter dealer. He was so favorably impressed by its remarkable uniformity, even though it came from many widely scattered plants, and by its unequalled keeping quality that he arranged to sell this type of butter under his own established brand, which already had a wide reputation for high quality.

This attracted the attention of other butter dealers, who soon found it advantageous to handle this type of butter. These dealers found that consumers were favorably impressed with sweet-cream butter because of its mild, creamy flavor, its uniformity in quality, and its property of maintaining its fine flavor in spite of the relatively high temperature to which it is exposed in the retail store and in the home.

Sweet-Cream Butter Output

Each year an increasing quantity of sweet-cream butter is manufactured. A number of creameries situated in what has always been

considered sour-cream territory are grading cream and making some sweet-cream butter; for instance, in one Southwestern State eight creameries, according to a recent report from that State, are making this type of butter.

A prominent butter dealer in New York City recently stated that most of the dealers in that city now handle some sweet-cream butter and that during the cold-storage season nearly all buyers are eager to obtain butter of this type.

An association of creameries reports that in 1926 it sold over 50,000,000 pounds of sweet-cream butter in 82 cities in the United States. This association also reports that it returned to its member creameries one-half cent a pound more for sweet-cream butter scoring 93 per cent than for ripened-cream butter of the same score.

Further evidence of the growing appreciation of this butter is indicated by the fact that each day for several months the following statement has appeared in a daily trade report issued in New York City:

> Some very fancy lots of guaranteed sweet-cream creamery sell mainly on contract, above our top quotations.

It appears then that sweet-cream butter is receiving its just recognition on the market and that it now occupies a high place in public favor.

WILLIAM WHITE.

DAIRY Success With the Milking Machine Requires Cleanliness Careful and well-informed dairymen have demonstrated that certified milk, which is milk containing not more than 10,000 bacteria per cubic centimeter at the time of delivery to the consumer, can be produced with milking machines. Market milk of a good grade has also been produced with milking machines operated under ordinary farm conditions. There is no short cut to cleanliness, however, and clean milk can not be produced with neglected machines.

Milking machines which are not washed and sterilized properly may be the direct cause of large numbers of bacteria in milk. With the use of mechanical milkers becoming more common in the production of market milk, cleanliness of these machines becomes a problem of great importance.

One of the important factors in producing clean milk with a milking machine is to wash the machine immediately after each milking. The sooner a machine is washed after milking the easier it is to keep clean. Furthermore, if it remains unwashed for any length of time, it will be the direct cause of a great number of bacteria in the milk. Although there may be times when the machine can not be washed immediately after milking, it can at least be rinsed by drawing clean water through it with the vacuum and then washed more thoroughly later.

Washing alone is not sufficient treatment for a milking machine if milk of a low bacterial count is to be produced. It is also necessary to sterilize the machine after washing. This may be done with heat or with chemicals. More uniformly low bacterial counts will be obtained, however, by the use of heat.

Method of Sterilization

The heat method or a variation of it, as advocated by this department, is both simple and effective for sterilizing milking machines. The heat method is as follows:

Immediately after milking the machines are rinsed with cold or lukewarm water drawn through them by vacuum. The flow may be broken occasionally by pulling the teat cups out of the water and then immediately immersing them. This is done 10 or 12 times. This process is repeated, using hot water containing washing powder, and the teat cups and tubing are washed with a brush. Then the machines are rinsed by drawing clean hot water through them by vacuum. The long milk tube with claw and teat cups is then detached from the head of the pail. The air tubes (on machines of inflation type) are plugged, and the whole is placed in a tank or can of clean water, care being taken that all parts are entirely submerged. The water is then heated, preferably with steam, to a temperature of 160° to 165° F. and allowed to cool gradually. The parts remain in the water until the next milking. A covered tank or can is preferable.

When steam is not available, the water may be heated in a wash boiler on a stove. If the water is so heated, it is best not to place the rubber parts in the water until the proper temperature has been reached and the boiler removed from the stove; otherwise the rubber parts may be injured by coming in too close contact with the heating medium.

It is desirable that once or twice each week the machines be taken entirely apart and washed thoroughly with brushes and hot water containing washing powder.

The moisture trap or check valve on the head of the machine requires cleaning every day.

Milking-machine pails and covers require thorough washing after every milking and then sterilizing, preferably with steam. It is necessary that pulsators and electric motors, when on the head of the pail, be removed before sterilizing. If steam is not available, the covers and pails may be sterilized by immersing in boiling water for five minutes.

Cleansing of the Vacuum Line

The vacuum line should be cleaned at least twice a year by drawing hot water containing washing powder through it with vacuum. If milk is drawn into the vacuum line, it is necessary that it be cleaned immediately after milking.

Variations of the heat method may be employed with equally as good results bacteriologically as when the heat method itself is used. Furthermore, the length of life of the rubber parts is materially lengthened by the former method.

In the variations of the heat method the units are treated in the same way as in the heat method itself except that at the end of 20 to 40 minutes they are removed from the hot water and placed in a refrigerator, in a weak chlorinated-lime solution, or hung in the milk room, which should be protected from flies and dust. They are left here until the next milking.

The chlorinated-lime solution is made by dissolving a 12-ounce can of chlorinated lime (containing 24 per cent available chlorine) in

1 gallon of water and filtering it. One ounce of this solution is then added to 3 gallons of cold water. This mixture should be made fresh daily.

L. H. BURGWALD.

DAIRYMAN'S Slogan Should Be "Not More But Better Animals" Through selection, feeding, and breeding, every dairyman should do his best to put his herd on a high production basis. His slogan should be "Not more but better dairy cows" (Fig. 68.)

A tabulation of more than 100,000 yearly individual records from cows on test in dairy-herd-improvement associations has shown a rapid and almost constant gain in income over cost of feed as production advanced from the lowest-producing groups to the highest ones. The cows that produced 100 pounds of butterfat a year brought in an average income of $14 over cost of feed. Those that produced 200 pounds of butterfat a year brought in an income of $54 over cost of feed. At 300 pounds of butterfat a year per cow this income was $96, at 400 pounds it was $138, and at 500 pounds it was $178 Thus, for every 100 pounds gain in butterfat there was a gain of about $40 in income over cost of feed. These figures are based on farm prices from all parts of the country, including the whole-milk districts.

A further analysis of these figures shows that one cow producing 500 pounds of butterfat a year brought in almost thirteen times as much income over cost of feed as the cow that produced 100 pounds. In other words, the dairyman with a herd of 10 cows, each producing 500 pounds of butterfat, would receive as much income over cost of feed as the dairyman with a herd of 130 cows each producing 100 pounds of butterfat a year.

There is an old saying that "you may as well sit idle as work idle." Certainly the dairyman who tries to earn a living by feeding and milking low-producing dairy cows is not sitting idle, but if the average production per cow is only about 100 pounds of butterfat a year that dairyman may truly be classed among those who spend their years in idle work.

Good Headwork Required

To build up a small herd of cows having an average butterfat production of 400 to 500 pounds per cow requires good headwork. To get the same profits from a herd having an average butterfat production of 100 to 200 pounds per cow requires much handwork. If a dairyman does good headwork, he can make life very much easier for his hands.

When the population of this country increases to 200,000,000, it should be easily possible for the additional supply of dairy products needed to be produced not by more but by better dairy cows. At the present time there are nearly 22,000,000 dairy cows in this country. The average milk production of these cows is about 4,500 pounds a year If this were increased at the rate of 100 pounds a year, in 45 years the average milk production per cow would be doubled. The present number of cows could then supply sufficient dairy products at the present rate of consumption for considerably more than 200,000,000 people. That such a gain in average production per cow

is well within the range of possibility is proved by the fact that many dairy herds are now above that average. What is being done in the way of increased production in many herds may eventually be accomplished in many more.

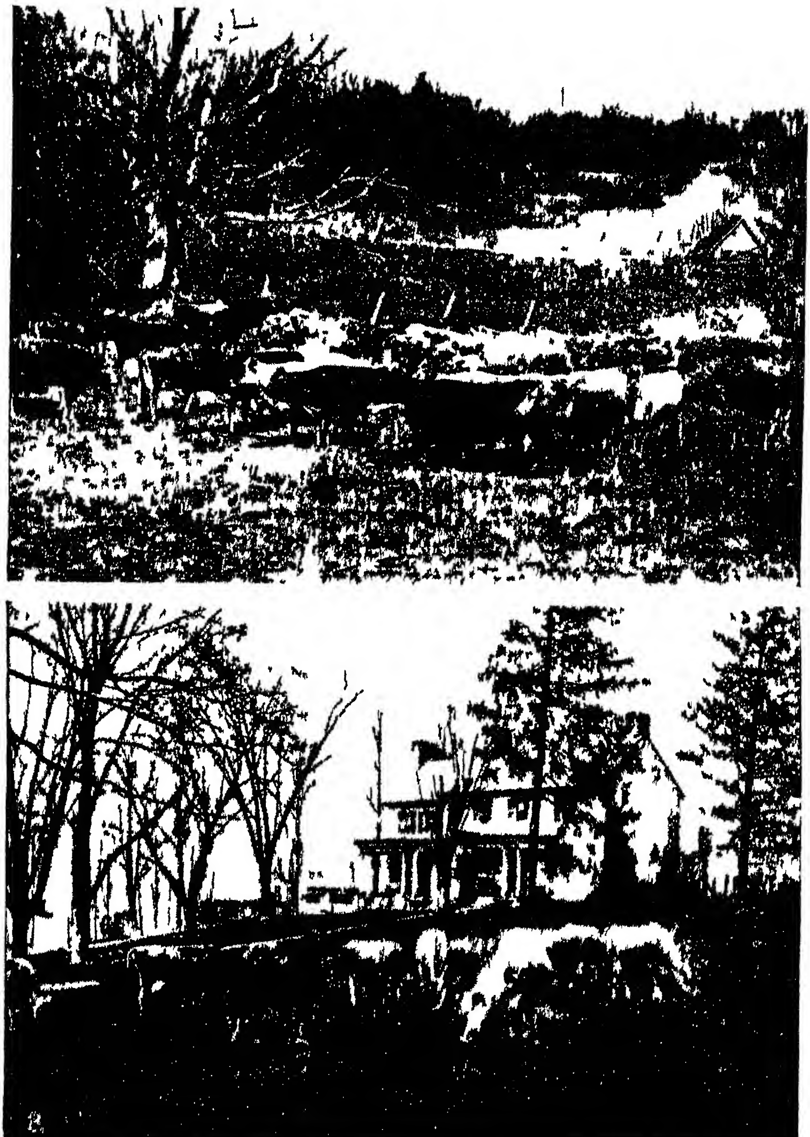


FIG. 68.—How selection and breeding improved one dairy herd. A, not more, but, B, better cows

More feed per cow will be required for the high-producing dairy cows, but dairy-herd-improvement association records also show that increased production per cow does not require a corresponding increase in quantity of feed or in cost of feed. The records show that

average milk production may be doubled with a feed increase of approximately 40 per cent. Therefore, labor and feed can be saved and milk production can be doubled if not more but better dairy cows are kept.

J. C. McDowell.

DAIRYMAN'S Utensils Can Be Sterilized by Steam Economically Milk and its products in the United States are steadily improving in quality because more careful methods are being used in their production. Dairymen realize that it pays to produce good milk, and as a rule are desirous of improving their methods. They have learned through experience and from scientific investigations that bacteria have a detrimental effect on milk and that unsterile utensils contribute more than any other source to bacterial contamination of milk. For these reasons milk utensils are usually treated in some manner to destroy the bacteria remaining on them after they are washed and rinsed. To accomplish this, moist heat in the form of boiling water or steam is the agent most generally employed.

Fig. 69 —Milk utensils in a sterilizing cabinet ready to be steamed

Milk utensils which have been washed can be practically sterilized by rinsing them thoroughly with boiling water or by immersing them in it. If there are many utensils, however, this method is laborious and uneconomical. Heat, in most cases, can be applied to the utensils more easily, effectively, and economically in the form of steam, which is usually either introduced into the utensils individually by means of a jet or is confined in a tight cabinet in which the utensils are placed. (Fig. 69.)

Utensils may be satisfactorily steamed over a jet if enough time is allowed, and in certain cases it is necessary to use this method. However, it is more laborious, more wasteful of steam, and not so dependable as cabinet sterilization.

Steam cabinets are of two general types—one which is operated with steam from a boiler or some other apparatus and another which produces its own steam by means of heat applied underneath. The latter type is constructed of metal, whereas the former may be made of concrete, wood, galvanized iron, hollow tile, or other material.

Operating a Cabinet With a Boiler

When operating a cabinet with a boiler it is best to introduce the steam at the bottom of the sterilizer so that it may pass directly into the inverted utensils and also to have the steam well distributed to insure uniform heating of the entire cabinet. For this purpose a pipe coil perforated at intervals of a few inches serves satisfactorily. In addition to the perforated coils it is well to install a larger closed coil to act as a radiator for drying the utensils, thereby preventing bacterial growth and the formation of rust which may occur, especially if the utensils are to be held for some time before being used. The drying process is as follows: After the utensils have been thoroughly steamed the steam is turned off the perforated coil, and dampers in the top and near the bottom of the cabinet are opened to facilitate the escape of the moisture. Steam is then turned into the closed coil at full boiler pressure.

There is a considerable difference in the quantity of steam and length of time required to operate sterilizing cabinets constructed of different materials. Much more steam is required, for instance, to heat an uninsulated concrete sterilizer or one built of similar material than is required to heat one constructed of wood or galvanized iron. If a concrete or similar sterilizer is well insulated on the inside, less than half as much steam is required; but in most cases this is impracticable. When a cabinet is insulated, a moisture-proof metal lining is necessary to prevent the insulation from becoming water-logged, and this alone costs almost as much as building the cabinet out of wood or galvanized iron in the first place.

Wooden Cabinets Also Effective

Wooden cabinets constructed of two thicknesses of 1-inch lumber and galvanized-iron cabinets are practically equal in efficiency. They are about two and one-half times as efficient in the use of steam as uninsulated concrete cabinets. At least twice as much time and more than twice as much steam are required to heat an uninsulated concrete cabinet as are required for either of the others. A steam boiler which is taxed to capacity in operating a concrete cabinet with uninsulated walls 4 or 5 inches thick will furnish enough steam for a wooden or galvanized-iron cabinet more than twice as large. A dairyman would therefore need a boiler of only half as much capacity to operate a wooden or galvanized-iron cabinet as he would need for one constructed of uninsulated concrete.

In destroying bacteria all cabinets are of equal value, provided they do not leak and are heated to the same temperature. It has been demonstrated that 10-gallon cans which were found to contain on the average 3½ billion bacteria, or enough to contaminate milk placed in the cans with about 92,000 per cubic centimeter of milk, were practically sterilized by steaming them above 200° F. for five minutes. After steaming, bacterial counts of only 3,300 per can were obtained on the average.

Small retail and medium-sized wholesale dairies can make economical use of a galvanized-iron box sterilizer and water heater which does not require a steam boiler in its operation. It consists of a square or oblong galvanized-iron box with a tight-fitting lid which is placed on a foundation serving as a fire box, or over some other heating medium. Milk utensils are steamed in such a sterilizer by

placing them on a false bottom over a small quantity of water, which is boiled in the bottom of the box. If the water is only one-half to three-quarters of an inch deep, the temperature of the sterilizer can be raised to approximately that of the boiling water in about one-half hour. When this box is used, an armful of wood or a bushel of corncobs is sufficient fuel to complete a sterilizing operation. If operated properly, the same efficiency in bacterial reduction can be expected from this kind of sterilizer as is obtained from one operated with a steam boiler.

R. J. POSSON.

DAIRYMEN in South Suffer Losses from Bitterweed in Milk

Dairymen throughout the country annually suffer enormous losses due to the production of unmarketable milk. Steps have been taken to prevent the losses caused by the souring of milk. It is too rarely recognized, however, that the production of milk containing feed and weed flavors is causing an annual loss probably as great as that caused by sour milk. One of the weeds causing milk to be unmarketable is commonly known as bitterweed.

FIG 70.—Bitterweed (*Helenium tenuifolium*)

Bitterweed (*Helenium tenuifolium*) is an erect annual plant from 10 to 24 or more inches in height, with slender stems, usually much branched, and numerous very narrow, almost grasslike, leaves. The showy flower heads are yellow and from about three-fourths of an inch to one inch in diameter. (Fig. 70.)

This plant is most abundant from Virginia and Missouri to Florida and Texas, although it is found occasionally farther north. In the South it is a common weed of pastures and roadsides.

Bitterweed, when eaten by dairy cows, gives a bitter, astringent taste to the milk produced. In many cases the bitterness is so intense that the milk is unfit for human food. As this plant is abundant in large areas of the Southern States, losses from this cause are sometimes very great.

The effect of bitterweed on milk differs from the effect of practically all feeds and other weeds in that the milk has a normal odor regardless of the bitterness of its flavor. Another difference is that in the case of bitterweed the bitter principle does not have an affinity for the butterfat. The flavor is more pronounced in skim milk than in whole milk and much less pronounced in the cream than in the skim milk. Of greater importance, however, is the fact that, unlike most feed and weed flavors, this weed flavor does not disappear from one milking to the next. In fact, it is present in milk produced 24 hours after the cows consume 10 pounds of the weed. Milk produced 27 hours after cows consume this amount is practically free from bitter flavor.

Weed Necessarily Eaten When Plentiful

Although cows will not consume bitterweed from choice, its abundance at times necessitates its consumption in large quantities. Cows must consume 4½ to 5 pounds of bitterweed one hour before milking, or 2½ to 3 pounds (one-half pound at one hour intervals) to within two hours of milking before its effect will be noticed. These amounts produce very slightly bitter milk. As the quantity of bitterweed consumed increases, the intensity of the bitter flavor in the milk also increases. When more than 7 pounds is consumed, bitter milk is produced, and more than 9 pounds produces very bitter milk.

The only practical method of preventing bitter milk in sections where this weed is abundant is by keeping the cows off infested pastures until the weeds can be exterminated. Investigations in the manufacture of various dairy products from bitter milk were carried on in an attempt to evolve methods by which the bitter principle could be eliminated. It was found that the bitter principle seemed to be in solution or in fine suspension in the water of the milk. Removal of practically all the fat, casein, albumin, and milk sugar still left the bitter principle in the serum. It was possible to make butter which, when properly washed, was free from the bitter flavor. The buttermilk, however, was not usable for human food.

Cottage cheese was made which, after being thoroughly washed, contained but a slight trace of the bitter flavor. Unsweetened evaporated milk, either skim or whole, contained the bitter flavor in an even more concentrated form than the original milk. Sweetened condensed milk contained a trace of the bitter flavor, but the added sucrose concealed the objectionable flavor to a great extent. It was also possible to extract crude milk sugar with hardly a trace of the bitter flavor. After the extraction of the fat, casein, and sugar the albumin in the residue was precipitated with alcohol and washed free from the bitter flavor. This operation showed that the albumin and the bitter principle are not associated and that the latter is soluble in alcohol. The alcoholic solution was evaporated to dryness, and further experiments showed the bitter principle to be a separate element or compound.

It appears that butter and cottage cheese may be made from bitter milk provided care is taken to wash them thoroughly. Furthermore, it is possible to make milk sugar from the skim milk or to make sweetened condensed milk of a fairly satisfactory character.

C. J. Babcock.

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DATE Plantings Free from Pests Begun in Irrigated Southwest Fully 100 varieties of date palms have been introduced into this country, and almost all of the choicest sorts of the Old World date gardens are already growing here, but many of these varieties are found here only in very limited numbers.

The date palm, unlike any other commonly cultivated fruit tree, can not be propagated by budding or grafting, but new plantations must be set out with offshoots cut from the base of the parent tree. As only a limited number of these offshoots are produced (from 10 to 20 on the leading commercial varieties), and as these offshoots can be cut off only one, two, or three at a time over a period of 5 to 10 years, it is impossible to propagate the date very rapidly.

As several dangerous insect pests occur in the date gardens of the Old World, offshoots can not be imported from abroad under the present plant-quarantine regulations.

As a result of these conditions, date offshoots are scarce and high priced. Offshoots of the standard varieties already grown on a fairly large scale in the Southwestern States usually bring from $10 to $25 apiece, which makes the cost of nursery stock very high, from $500 to $1,250 an acre at the usual planting cost.

Pests Introduced with Date Offshoots

The date offshoots brought to this country on a small scale in 1900 and on a much larger scale from 1910 to 1915 introduced into the New World four dangerous insect pests that have been carefully studied by American entomologists. In fact, two of these four major insect pests were discovered and given scientific names in this country. Under Old World conditions none of these pests seem to do very grave damage, although all of them attack the date palm more or less seriously. In the New World, however, at least one of these insect pests, the Parlatoria scale, showed signs of being very injurious and very hard to control; consequently, an effort has been made to eradicate this scale insect. The three other date pests—namely, the Phoenicococcus scale, the date spittle bug, and the date mite—cause appreciable damage but can be controlled by proper spraying and dusting.

In order to prevent the spread of these insect pests, uncertified date offshoots are not allowed to move interstate from a restricted district including parts of five counties in southeastern California and southwestern Arizona and one county of southern Texas.

The date palm is well adapted to culture in parts of six other counties adjoining this district in California, Arizona, and Nevada, and certain varieties promise to grow well in a large district in southern Texas, including parts of 10 or more counties. Under the present regulations no offshoots may be shipped to these regions, from leading date-producing areas as can not be certified free from infestation, so there is no way open to test the leading date varieties there.

New Method of Propagation

It is fortunate that just as date culture became generally recognized as a very promising new industry, leading to an urgent demand from all parts of the Southwest for offshoots, a new method was discovered for propagating date palms free from all insect pests and fungous diseases.

In connection with the investigations of Fenner S. Stickney, of the Federal Horticultural Board, on the life history of the principal date-insect pests in order to provide the necessary scientific basis for the eradication of the Parlatoria scale, the discovery was made that it was possible to kill all insect pests on date offshoots by heating in an oven at a high temperature for a time long enough to kill the growing point of the offshoot. At first these offshoots were supposed to have been killed outright, but it was found by Doctor Stickney that if the heating was stopped as soon as the growing point had been killed, these offshoots, if planted and cared for properly, showed a rapid growth of side buds that had been in a dormant condition when the offshoots had been heated. These experiments by Doctor Stickney in cooperation with the United States Experiment Date Garden of the Bureau of Plant Industry at Indio, Calif., have been under way for the last five years and have shown clearly that such treatment carefully carried out does kill the hidden date-insect pests that occur on almost all date offshoots and which are so hidden and protected in the leaf bases that they can not be reached by spraying or fumigation. As is to be expected, a treatment so severe as to kill not only the principal growing point but all of the more active side buds often kills the offshoot outright. It is not uncommon for such treatment to kill one-fourth, one-third, and sometimes even one-half of the offshoots heated.

Terminal Bud Not Always Killed

There is another complication in that some offshoots, perhaps because of some slight difference in texture or condition at the time of treatment, go through such treatment without having the terminal bud killed. Perhaps this happens with 1 offshoot in 10. There is no assurance that such offshoots have been treated sufficiently to kill the insect pests, and such offshoots must be destroyed or returned to the point of origin.

Fortunately many of the valleys suitable for date culture in California and Arizona are isolated by vast unirrigated desert wastes, high plateaus, and towering mountains where dates can not grow. If, therefore, clean offshoots freed from all insect pests by the drastic heat treatment can be set out in such isolated valleys, with proper care and proper protection by quarantine regulations, they will stay free from insect enemies, and a pest-free date region will thereby be established, producing pest-free offshoots that can be shipped to all parts of the United States where dates can be grown.

Already five pest-free date plantings have been made in the four date-growing States—two in California; one partly in California, partly in Arizona, and partly in Nevada; and one each in Arizona and in Texas. The oldest and largest of these plantings is below sea level in Death Valley between the Sierra Nevada Mountains and Nevada. The second planting in California is in Borego Valley in the northeast corner of San Diego County. The Mohave Valley pest-free district lies in the extreme southern part of Nevada along the Colorado River and in the adjoining parts of Arizona and California. A very small planting has been made in southwestern Arizona near the Mexican border in the Papago Indian Reservation. The fifth and latest planting has been made at the Weslaco substation of the Texas Agricultural Experiment Station in the lower Rio Grande Valley in extreme southern Texas.

Other Isolated Regions May Try Plan

At the present time (October, 1927) there are, therefore, already in existence in the United States five pest-free date regions, and it is possible that a few more well-isolated regions may adopt this new system of date culture which insures permanent freedom from all dangerous insect pests and at the same time permits offshoots to be sent to other places no matter how strict their quarantine regulations.

In addition to the insistent demand for date offshoots for planting in those parts of California, Texas, Arizona, and Nevada where high-class dates can be grown on a commercial scale for shipment to distant markets, there is a demand, and a rapidly growing one, for date palms for dooryard plantings and for ornamental purposes in regions where dates can not be grown profitably on a large commercial scale. The region where dates can be grown for ornament and as a dooryard fruit tree is very much larger than the region outlined above and probably covers nearly three-fourths of California, one-fourth of Arizona, and the whole Gulf coast region from southern Texas to southern Florida, and up the Atlantic coast as far north as South Carolina, a total of perhaps 150 counties, to say nothing of Hawaii, Porto Rico, and other insular possessions.

Permanent Date Nursery

Only offshoots from pest-free regions can be shipped to any of these places, so it is highly probable that a permanent date-nursery business will grow up in these pest-free date regions to supply pest-free offshoots not only to the commercial date-growing regions of this and other countries but also to the much larger regions in this and other countries where the date palm can be grown as dooryard fruit trees and for ornament.

At first sight it would seem that pest-free date plantations could be established for the purpose of growing nursery stock in regions where the climate is not hot enough to permit the growing of dates suitable for packing. It has been found, however, that in the regions where date palms would be planted in dooryard gardens and for ornamental purposes the date palm is very susceptible to the attacks of a fungous disease caused by *Graphiola phoenicis*. This fungous disease is very difficult to control and would interfere with the shipment of date offshoots to any part of the United States or to any foreign country. This fungous pest fortunately does not readily gain access to desert regions, so the pest-free date regions that have been established in the hot, dry irrigated valleys of California, Arizona, Nevada, and Texas can doubtless be kept entirely free from this and other fungous diseases as well as from all dangerous insect pests.

WALTER T. SWINGLE.

DEWBERRY of the Young Variety Has Excellent Qualities

The Young dewberry variety is remarkable for its dessert and culinary qualities, vigorous growth, and disease resistance. Its fruit is large for a dewberry, deep wine color, juicy, sweeter and richer than the Logan blackberry or the Lucretia dewberry. The plants are more vigorous, propagate even more freely, and are more resistant to anthracnose and

common leaf-spot diseases than either of the above-mentioned sorts. These characteristics have led the United States Department of Agriculture to recommend a thorough trial of this variety for home use and the local market and also for the general market. (Fig. 71.)

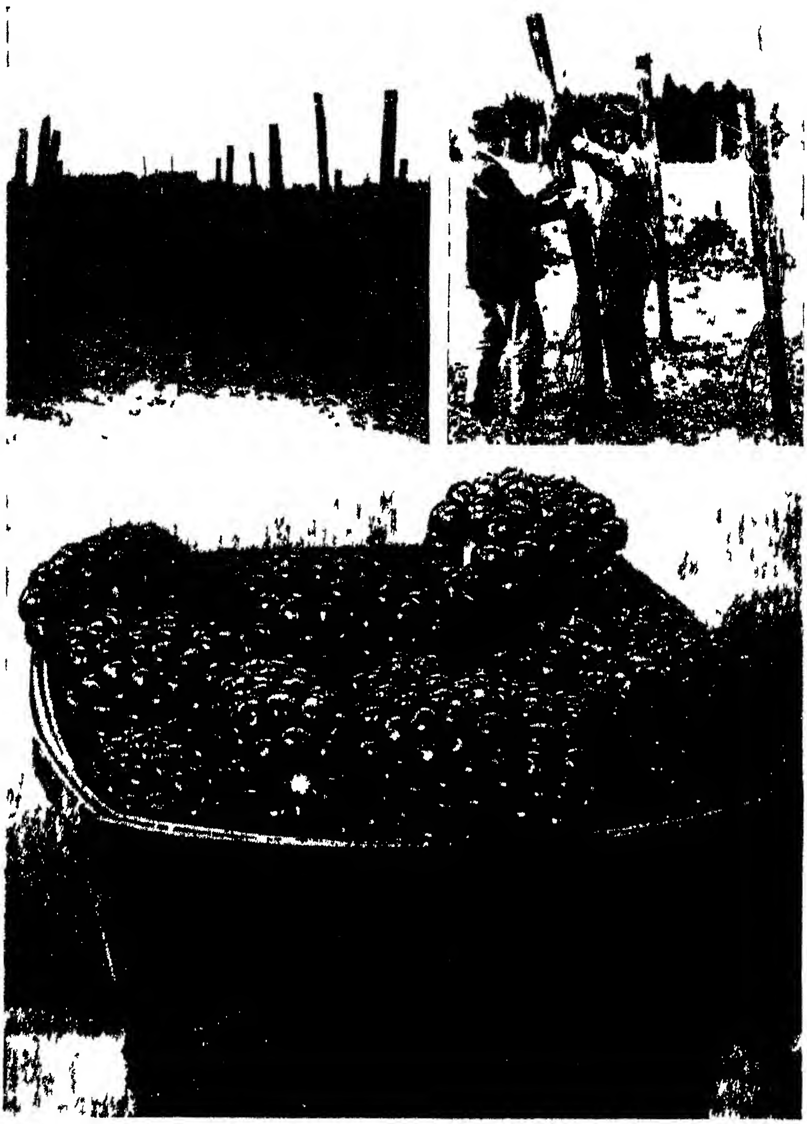

FIG. 71.—Upper left, Young dewberry in early spring, upper right, all vigorous canes are being trained to the stake in a spiral; lower, pint basket of the Young dewberry, showing its large size and the large size of its drupelets

For the last three years the Young dewberry has been widely tested. As the result of these tests it is known to succeed well in central and eastern North Carolina, in Georgia, Alabama, Mississippi, Louisiana, eastern Texas, and California. It is promising also in the

Puget Sound region of Washington. Although the northern limit of its successful culture is not known, it should be tried from Virginia southward to northern Florida and westward to Arkansas and eastern Texas and in western Washington, Oregon and California. It does not seem to be entirely hardy at Washington, D. C.

Because of its high dessert quality, the fruit of this variety has sold for much more than that of the blackberry and the common dewberry. The National Preservers' Association research laboratory has tested the variety for preserves and has reported that it made a more attractive product in flavor, texture, and color than the blackberry. For making commercial preserves the laboratory recommends equal parts of sugar and fruit with the addition of a slight quantity of citric acid to bring out the best flavor. As a fresh-fruit drink the juice is apparently equal or superior to that of the Logan blackberry and much superior to that of any other bramble.

Unique History of the Variety

The history of this variety is unique. It was almost lost to horticulture even after its merit was first partly recognized. It was originated by B. M. Young, of Louisiana, as the result of a cross of the Phenomenal blackberry with the Austin Mayes dewberry, made in 1905. Plants of it were given to J. F. Jones, then of Jeanerette, La., but who later moved to Pennsylvania, taking plants with him. Meanwhile all plants on the place of the originator were destroyed. In November, 1921, Mr. Jones sent a few of the plants to the Department of Agriculture for testing. When they came into fruiting in 1923 they immediately attracted attention. Plants were propagated and the variety sent out for trial. Mr. Jones also sent plants to southern Alabama, where the variety succeeded and is now being grown commercially.

The culture of this and other dewberries and trailing blackberries is discussed in Farmers' Bulletins 998 and 1403.

George M. Darrow.

EDUCATION Scope in Agriculture Cultural as Well as Technical

The foundation for the American system of agricultural and industrial education was laid by the Morrill Act of 1862, which gave to each State 30,000 acres of public land for each Representative and Senator to which it was entitled in Congress. The proceeds derived from the sale of this land, including the interest on the funds, was to be used for the support of—

> at least one college in each State where the leading object shall be, without excluding other scientific and classic studies and including military science, to teach such branches of learning as are related to agriculture and mechanic arts in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life.

This movement marked the beginning of a new era in American higher education. It was a notable departure from the traditional aristocratic conception of education. The provisions of the Morrill Act have been sufficiently broad and elastic for the development of a comprehensive system of agricultural education throughout the United States. Subsequent acts of Congress have aided materially

in promoting scientific research and the teaching of agriculture in colleges and secondary schools, and in extending practical agricultural information to all parts of the country.

The land-grant institutions emphasize the fundamental importance of the vocational subjects. However, there is nothing in their system of education that restricts or limits instruction to the vocational field. The curricula are so organized that the liberal and the vocational courses are combined during undergraduate study. Broad foundation training, particularly during the first two years of the college course, is considered essential to prepare students for some specialization in the junior and senior years and during graduate study. These curricula provide vocational and technical training in agriculture and the interrelated sciences and in such liberal or cultural subjects as history, English, economics, sociology, education, etc. The latter courses are offered to enable agricultural students to acquire the essential training in culture and general education for useful service and leadership in the various pursuits open to agricultural graduates. The agricultural courses comprise subjects in the general fields of plant and animal production, agricultural economics, agricultural engineering, sociology, etc. These courses, with the natural sciences, furnish the scientific and vocational knowledge necessary in scientific farming or in professional work relating to agriculture.

Purpose Not Merely Technical

The land-grant colleges have had to recognize that their purpose is not only to provide vocational and technical training, but to consider the needs of students who may desire to enter occupations related directly or indirectly to agriculture. These institutions are leaders in a broad system of education designed to improve agriculture and country life. The agricultural colleges differ from other institutions of higher learning in having functions of research and extension work under Federal and State regulations. This requires them to maintain experiment stations with a staff of highly specialized workers and a staff of extension specialists. Through the latter agency the colleges deal personally and otherwise with large numbers of the rural population. It is the duty of the land-grant colleges to reach, if possible, more than a third of the total population of the entire country residing on approximately 6,500,000 farms, and to supply this population with the best available information with reference to the improvement of soils, crops, livestock, farm management, insect pests and diseases, and whatever pertains to the general improvement of agriculture and rural life. They are also required to train agricultural teachers for colleges, secondary schools, and extension work.

Although the land-grant colleges have vocational aims, they can not properly perform the function of professional schools. They comprise a broad system of education that trains for leadership. It is important that their graduates have an education broad enough to enable them to deal intelligently with various problems. To meet the needs of changing conditions, the colleges have naturally found it necessary to revise their curricula from time to time. The agricultural curricula now offer greater freedom in the election of courses of special interest. A four-year college course should not be confined to a narrow field of study. It should provide broad training in both cultural and vocational subjects. The purpose is to furnish the voca-

tional and liberal training that is essential to the development of the highest type of citizenship.

Differences of opinion exist as to what aims a college course in agriculture should have. Some leaders in higher education in agriculture believe that the aim should be to prepare for scientific farming. Others maintain that the aim is to prepare for the professions and scientific work only. It is doubtful if the purposes of such courses can be accurately defined in terms of one or two major objectives.

Occupations of Graduates

Study of data obtained from deans of 19 land-grant institutions widely distributed show that there should be more than one or two objects in agricultural college courses. Many of these institutions have data showing the occupations or professions in which agricultural graduates are now engaged. These data have been classified to show the percentage of agricultural students engaged in (1) scientific farming, (2) in research work, (3) in teaching, (4) in extension work, (5) in business related to agriculture, and (6) in miscellaneous pursuits.

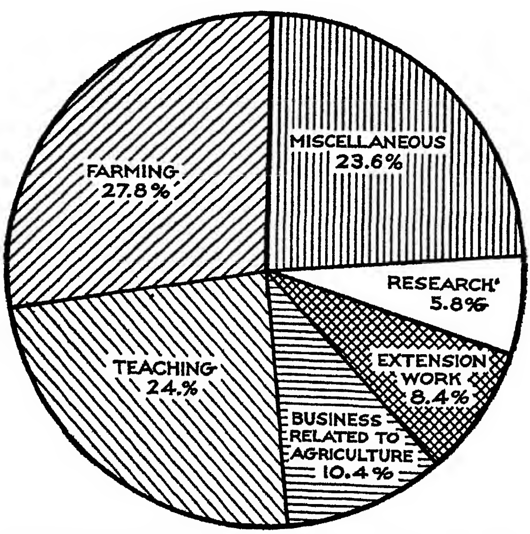

FIG 72—Average percentage of agricultural graduates from 19 agricultural colleges engaged in various pursuits

The graph (fig. 72) gives the average percentage of agricultural graduates from these institutions engaged in various pursuits.

The foregoing data show that an average of 27.8 per cent of agricultural graduates engaged in scientific farming as a pursuit. The percentage varied from 8 per cent in Florida to 50 in Kansas. An average of 24 per cent of the graduates engaged in teaching. The percentage varied from 12 per cent in Massachusetts to 32 per cent in North Carolina. The average percentage entering extension work was 8.4 per cent. The percentage varied from 4 per cent in Rhode Island to 26 per cent in Georgia. The average percentage that entered business related to agriculture was 10.4 per cent. The percentage varied from 4 per cent in Minnesota to 24 per cent in Texas. The average percentage that entered the miscellaneous group was 23.6. The percentage varied from 8 per cent in North Carolina to 46 per cent in Mississippi. The average percentage that entered research work was 5.8 per cent, representing a variation from 5 per cent in Texas to 12 per cent in Florida.

The total average in percentage of agricultural graduates either farming, in agricultural professions, or in business related to agricul-

ture, is about 78 per cent. In other words more than three-fourths of the graduates are engaged in pursuits for which their professional and technical training definitely prepared them.

More than one-fourth of the agricultural graduates select careers in scientific farming. This is a creditable showing. Increase in the number of agricultural teachers required in colleges, secondary schools, and agricultural extension service has created many demands for the services of men trained in agriculture. Farming offers opportunities for those trained in the science and art of agriculture, especially when such persons have capital to purchase land and other equipment. But it is hardly reasonable to expect that any one pursuit in agriculture or otherwise will offer sufficient inducement to all who have had college training in agriculture. It is therefore obvious that many such graduates will choose to enter professions or occupations outside the realm of farming. The criticism sometimes made against the agricultural colleges, that they educate young men away from the farm, is unfair. The fact that the agricultural curricula offer training to prepare students for a wide range of activity is a credit to their usefulness. One of the outstanding needs of rural life is a larger number of actual farmers trained in the science of agriculture and having a good knowledge of the fundamental principles of farming as a business. Such a situation will be possible only so far as the business of farming offers opportunity and rewards comparable to other kinds of pursuits. One of the aims of college courses in agriculture should be to prepare students for scientific practical farming, but this should not be the sole aim.

Development of Research

One of the greatest contributions made to higher education in agriculture during the past quarter of a century is the development of scientific research at the various agricultural experiment stations and in the United States Department of Agriculture. Agricultural progress whether on the farm, in the classroom or in other lines of agriculture, has been materially aided by scientific research. As problems of the farm increase, there will be a greater demand for knowledge made available through scientific research. To meet present-day needs the scientific staff of the agricultural experiment stations should be adequately trained for research. The land-grant colleges are assuming large responsibility in preparing students for service in this field.

The rapid development of agricultural education below college grade during the past decade through the teaching of vocational agriculture in the high school and through extension service has demanded the services of many agricultural graduates who might have otherwise engaged in farming or other lines of business related to agriculture. During this period the agricultural colleges have established teacher-training divisions and now maintain special facilities for training agricultural teachers for secondary schools.

Vocational education in agriculture of secondary grade, according to the Smith-Hughes Act, is "to be of less than college grade and designed to meet the needs of persons over 14 years of age who have entered upon or who are preparing to enter upon the work of the farm." While it is true that a great many of the agricultural students

in the high schools, enter farming immediately after completing their courses, many decide to continue their studies and enter college for further training in agriculture. This body of students coming into the agricultural colleges has stimulated the enrollment of agricultural students. From this group of students should emerge many scientific farmers, agricultural teachers, extension workers, and leaders in many other lines of educational work.

In substance the purpose of agricultural extension work according to the Smith-Lever Act is "to give instruction and practical demonstration in agriculture and home economics to persons not attending or residing in colleges and to impart to such persons information on agriculture and home-economics subjects through field demonstration, publications, etc." Many rural boys who come under the inspiring leadership of extension agents decide to remain on the farm. Some later enroll in agricultural colleges and after graduation become leaders in agricultural education. The latest available data indicate that more than one-third of the agricultural college graduates engage in teaching and extension work.

Opportunities in Related Fields

Many opportunities are open to students who desire to prepare for services in fields related to agriculture. A little more than 10 per cent of these graduates are now serving in such fields. Rapid agricultural development has opened many new lines of work. Many commercial and industrial concerns seek the services of energetic young men with agricultural training. Among them are fertilizer industries, packing houses, commercial fruit growers associations, large town and city banks, flour mills, and dairy industries. Some agricultural graduates of ability and initiative find opportunities to enter into partnership with landowners who are willing to furnish the land and capital in exchange for scientific agricultural training. Pursuits in which agricultural graduates of land-grant institutions are serving indicate the scope of these institutions in training men for leadership in many fields.

The economic value of a college course in agriculture is apt to be questioned, especially during agricultural depressions. The national program of agricultural education aims to develop greater efficiency in farming, which means economic production and intelligent distribution through more effective methods of cooperative marketing of agricultural products. It also aims to improve conditions in the farm home and in rural communities. To be successful the farmer, like other business men, must have good judgment and skill in both production and distribution. The American farmer is rapidly acquiring this knowledge. Training offered in agricultural college courses is of tremendous advanatage to those desiring to become successful farmers. Data collected by some of the land-grant institutions show conclusively that those farmers who have had special training are amply repaid for time spent in getting it.

A study of 1,271 farmers was made by the Georgia State College in 1925. Records obtained showed that farmers with a common-school education had a yearly income of about two and one-half times as much as farmers without schooling. Farmers with a high-school education earned a year approximately three times as much as those without schooling. Farmers with a short course in agricultural edu-

cation earned about four times as much as those without schooling. Farmers with an agricultural college education earned over five times as much as those without schooling.

The Kansas State Agricultural College made a study of 1,237 farmers which showed that farmers with an agricultural college course had a yearly income of about three times as much as those with a common-school education.

A study prepared by Cornell University showed that 5 per cent of farmers with an elementary-school education had a labor income above $1,000; that 20 per cent of the farmers with a high-school education had a labor income of more than $1,000; and 30 per cent of the farmers with more than a high-school education had labor incomes of about $1,000.

A study made at Pennsylvania State College of the salaries of several hundred agricultural graduates showed that the average salary of the group was $2,600. Eighty-six received salaries ranging from $2,500 to $3,000; 78 from $3,000 to $4,000; 12 from $4,000 to $5,000; and 24, $5,000 and above.

Cultural Side of Education

In addition to its vocational value, agricultural training offers definite cultural and intellectual advantages. Farming should not be regarded as a vocation from which the participants derive only a mere existence. It is a mode of life, with a meaning deeper than that of producing raw material for food and clothing. To meet the national need of keeping a sufficient number of prosperous and happy people earning their living from the soil, farming interests must be considered educationally, economically, and socially. Country life must be made attractive and wholesome and must provide opportunities for services and rewards equal to those offered in other kinds of pursuits.

Agricultural college graduates need cultural training that will put them on an equal footing with graduates from other kinds of institutions. Any program of training that aims to develop industrial efficiency without due regard to the fundamental cultural subjects is inadequate. Cultural education, important though it is, does not in itself insure economic efficiency. Any education that functions properly in the vocational field can not fail to have some degree of culture. Within certain limits agricultural curricula should permit considerable freedom in the selection of courses that lead to a degree. Obviously the technical or vocational concept must be conserved. But it is important that the liberal or cultural training should not be omitted. Modern farmers and other agricultural workers desire and are entitled to live and spend a part of their time in the realm of thought outside their vocation.

E. H. SHINN.

EGGS from Poultry Farms that Specialize a Factor in Markets The growth of specialized egg farming, since the World War, has been one of the outstanding developments in agriculture. It was not until after the war that specialized egg farming developed sufficiently to be an important factor in egg production. Poultry was one of the Nation's

largest agricultural industries, but was the least organized. Nine out of ten farmers kept poultry, but very few producers paid any attention to the individual hen.

Economic conditions were favorable for the growth and development of specialized egg farming for the six-year period previous to 1927. Eggs and poultry were relatively higher in price than dairy products, meat animals, and many other farm products. Feed prices were also favorable to egg and poultry producers during this period. The peculiar characteristics of specialized egg farming were a further incentive to the phenomenal growth of this phase of the poultry industry, following the war. It was easy to get either into or out of the business. Comparatively little capital was needed to get started and one did not have to wait long for returns.

Farm Flocks Chief Egg Supply Source

Even though the growth of specialized egg farming during the past decade has been phenomenal, it is still a minor factor in the

FIG. 73.—One of the modern poultry breeding plants on the West coast. This plant has trap-nest capacity for 2,700 birds in addition to space for 3,000 breeders

total production of eggs in this country. The enormous production of the farm flocks, conducted as supplementary enterprises to crop and livestock farming, still accounts for about 85 per cent of our annual egg crop. The specialized egg farms, even in the well-known intensive poultry counties of the country, are greatly outnumbered by the farms with small nonspecialized flocks in those same counties, as in Sonoma County, Calif., with its world-famous poultry center, Petaluma. But in that county the flocks with over 900 birds produce over 80 per cent of the eggs in the county.

Specialized egg farming had its beginning in the vicinity of the larger cities. Its purpose was to supply the local market with a high-grade product throughout the year at prices usually several cents above those received for the general run of farm eggs. In some sec-

tions, particularly on the Pacific coast, egg production of the specialized type increased more rapidly than did the local population. (Fig. 73.) New market outlets were necessary and cooperative effort was given a trial. As the experiment showed signs of being successful, specialized egg-farming communities were developed for the purpose of supplying high-grade eggs for shipments to eastern markets.

The future for specialized egg farming will be as sound and secure as the poultrymen coming under this class are willing to make it. The time is past when specialized poultrymen can expect to survive the competition of the small farm flocks if they follow ordinary flock methods and practices. Specialized poultrymen must produce special-quality eggs and be able to dispose of them at special prices in order to remain in the business. They will be required to maintain not only a high average annual egg production but a high production during those months when the best eggs are scarce. They will be expected to take even greater precautionary measures against poultry diseases.

E. R. JOHNSON.

EXHIBITS for County and State Fairs Aid Educational Work Farm people have learned to look to the educational exhibits at State and county fairs for new ideas that will help them to become better farmers and home makers. At some fairs a new kind of county exhibit has been developed, known as the county-project exhibit. Such exhibits are of special interest because they are set up in such a way as to bring out the advantages of some improvement in daily farm or home practices. They suggest how these practices may be adopted and give the cost and sources of material. These exhibits have been popular with State-fair secretaries and fair boards because of their educational value and their appeal to visitors. When well planned and prepared they usually get the attention of more people than the usual miscellaneous collection of farm products which make up the average county agricultural exhibit. Among the State fairs which made special provision for county project exhibits during 1927 were Arkansas, Georgia, Illinois, Indiana, Iowa, Kansas, Minnesota, Montana, Tennessee, Washington, and Wisconsin.

Variety of Subjects Presented

Many different agricultural subjects of interest to progressive farmers have been presented in these exhibits. The aim is to present a practical remedy for an important farm or home problem simply and clearly enough to be easily understood by the average person. The county project exhibits winning first places at five of the 1927 State fairs were as follows: Soy beans as a cash crop, Iowa (fig. 74); rat extermination methods, Wisconsin; saving pigs through hog-lot sanitation, Minnesota; poultry house construction, Kansas; and progress in dairy industry, Arkansas.

Other subjects presented were: Sweet clover, improved seed varieties, Hessian fly control, farm accounts, spraying apples, seed selection, lime, erosion control, cow-testing association records, farm wood lots, dairy feeding, cooperative livestock shipping, egg marketing, poultry feeding, poultry culling, self-feeders for hogs, tubercu-

losis eradication, dairy feeding rations, and alfalfa. Such exhibits at State fairs can usually be found in the agricultural or horticultural building near the county agricultural exhibits of vegetables, fruits, grains, and grasses.

Among the subjects taken up in similar exhibits in home economics were: Suitable meals for children, school lunches, nature's tonics, the canning budget, home conveniences, suitable garments for the school girl, health habits, proper height of kitchen sink, room furnishings, sick-room equipment, and recreation for children.

The high standard of quality of the project exhibits, which is often equal, if not superior, to the best commercial exhibits at the fair, is due to the fact that only a limited number of carefully prepared exhibits can qualify. They are usually prepared by or under the supervision of the county agricultural agent or the county home demonstration agent, and the counties selected to prepare the exhibits are those counties in which outstanding extension work has been done in the subject presented.

Well Worth the Cost

County extension agents and local committees have been interested in developing such exhibits because of the special recognition which comes from putting on a highly educational exhibit at the State fair. It is also advantageous to the counties because the premium usually pays for the cost of the exhibit. This same exhibit is usually shown at the county fair as well as in show windows in the smaller towns in the county, thereby reenforcing farm visits, meetings, press material, and other methods of encouraging the adoption of improved practices in agriculture and home economics. Brief pamphlets are frequently handed out at the booth to supplement the exhibit.

The cost of project exhibits is taken care of by some farmers' organization or committee within the county. The amount of premium money remaining, after paying for cost of exhibit, is generally turned over to the financing organization for use in building a similar exhibit for the State or county fair the following year. In most of the State fairs where these exhibits have been provided for, the premium money offered has been an average of $150 per county and the number of counties allowed to compete has usually been limited to seven or less in order to keep the standard of quality high. The premium allowed by one fair is the cost of the exhibit plus a small additional amount for each of the best exhibits.

Judging Project Exhibits

County project exhibits are judged by how forcefully they tell the story they are intended to present. The main points considered are: (1) Does the caption tell what the exhibit is about and suggest the message presented in the exhibit? In this respect the caption or title sign is like the heading of a newspaper article. (2) To what extent has the exhibit an unusual or special attention-getting feature to attract the attention of a large number of people? (3) Is it interesting to a relatively large number of farm people because it relates to a practical problem, and is it easy to follow and understand the material and facts presented, so that one is willing to read or look through all material and facts presented? (4) Does it make one

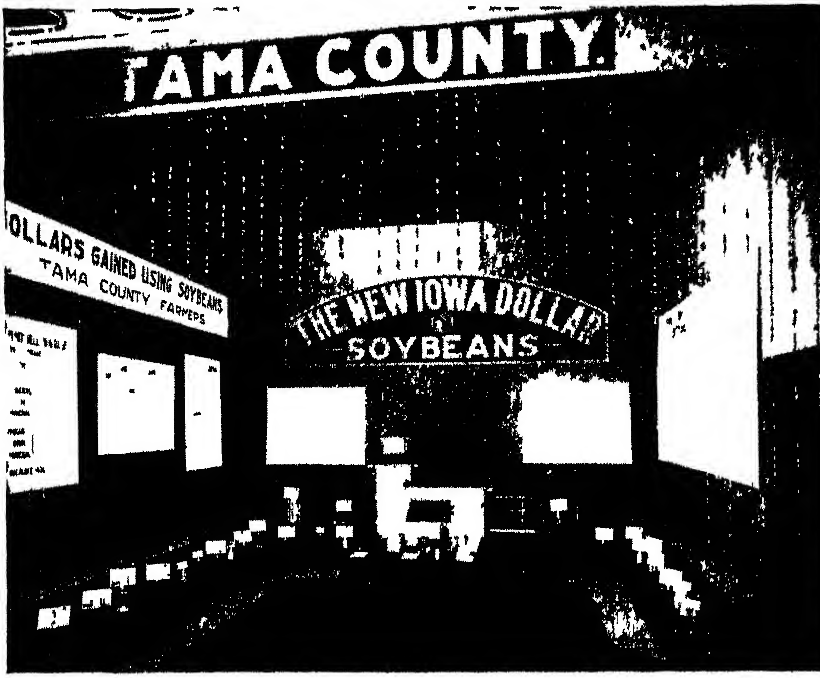

FIG 74—County project exhibit emphasizing the importance of soy beans as a cash and feed crop. This exhibit won first prize at the Iowa State Fair in 1927

FIG 75—County project exhibit emphasizing progress in alfalfa introduction and decrease in wild hay acreage, shown at the Minnesota State Fair

conscious that he needs this remedy and does it make him want to have the resulting benefits, such as increased profits, comforts, or conveniences which can be expected from adopting the recommended practice? (5) Does it set forth the best reasons for adopting this practice and make one decide that he wants to take the trouble to adopt the practice because he is convinced that it is worth while or that it will pay by showing the possible gain, low cost, and ease of adoption? (6) Are maps or other means used to show that the remedy presented has been both successful and extensively used in the county represented? (7) Does the exhibit impress you favorably by being well arranged, neat, and artistic? (8) Is the labeling adequate and the lettering appropriate and easy to read?

Farm people have not only benefited by studying such exhibits, but the committees cooperating with the county extension agent get a considerable amount of satisfaction from seeing the results of their work and their ideas built into the exhibit. The study of these exhibits at the State fairs has helped many townships, communities, local farm or home clubs, and 4-H clubs to prepare similar exhibits for county fairs.

H. W. Gilbertson.

EXPENSE Record Book Can Be Made at Home to Suit Family's Need

More and more families are realizing the value of keeping a record of the money they spend and of the things they buy. Many want to keep such a record but say that they can not find a household expenditure book which suits their particular needs.

Of course no two families are alike. Each has its own needs, its own tastes, its own special ways of spending and of saving. One family wants to keep a record of the expenditures on food in detail. Another feels that it has learned to buy its food with a great degree of efficiency and that a much more general record of food expenditures is all that it requires. But this family somehow never has the proper clothes, and there is no money for the new book they would like to have. Where does their money go? They need a detailed record of expenditures other than food.

So it is easy to see that no one type of expenditures book will fulfill the requirements of every family. But why should not a family make such a book for itself? It is not much trouble, and one of the children would greatly enjoy ruling the lines, particularly if he has red ink to use.

In most cases an ordinary 8 by 10½ inch loose-leaf notebook, with ruled sheets, is the best thing to use. The loose-leaf book is more convenient than a bound book because the detail in which the record of expenditure on different items is kept can readily be changed from time to time as new needs may arise. One page is used for each main type of expenditure. Thus there is a page on which to record food purchased. This should be ruled like Figure 76.

Food purchased each day would be entered, the expenditures for each month added, the total transferred to the "Summary" (described below), a line drawn across the page and the entries for the next month made immediately below it. For food, most families keeping an itemized record would use one page a month. For the other items as health and so on, one or perhaps two pages might be sufficient

to carry the entries for the entire year. In the case of clothing, one page or one column should be used for each member of the family so that the clothing expenditures of each may be totaled separately.

In order to know how well the plan for expenditures and the actual expenditures are keeping together, the three entries, "Estimate for year," "Spent to date," and "Estimate for month," may be written in at the beginning of each month.

Pages ruled like Figure 76, with changes in headings, may be used for clothing, health, development—which includes all expenditures for formal education, reading matter, church and other social welfare contributions, gifts, recreation, and vacation—automobile, savings, furnishing and equipment, and also for housing if the family is renting.

Different Types of Pages

Where the family is living in its own home, housing would be recorded on a page ruled like Figure 77. Such a page, with appropriate subheads, would also be used for recording operating expenditures, and for income received. Operating would need more columns

Food

Date	Food purchased	Amount		Date	Food purchased	Amount	
	Estimate for year				Estimate for month		
	Spent to date						
	Estimate for month						

FIG. 76.—Form for recording food expenditures

for subheads than are shown for housing. Under operating the columns might be headed, for example, fuel, light, power; telephone, water, ice; household supplies; paid service, laundry; stationery, postage, etc. This type of page might also be used for development if the family wished to keep the details for the various subheads, like education, in separate columns. The same applies to clothing where a record separating outer garments, footwear, and so on, is desired.

On these pages the entries would be made and the totals found as described under Figure 76.

One of the most important parts of a record is the summary. This form is prepared by writing down on the left-hand margin of a page the headings and the subheadings of each page described above, then ruling 14 columns across this page and the one opposite it, and heading the first 12 columns January to December, and the last 2 "Total expenditures for year" and "Total planned expenditures." At the end of every month the totals from each page would be transferred and written in under the proper month after the suitable head or subhead.

After ruling the pages it would be well to make a cut-out index or to fasten index tabs down the right-hand side of the pages, so that, for example, one could see at a glance what page to turn to when making the entries for clothing.

The pages so far described will care for the cash expenditures of the family. But the family may also want to know the value of the farm products used in the household. A page similar to Figure 77 could be used for this record, heading the columns fruit and vegetables, meat, milk, fuel, and ice, according to the items furnished by the farm. The amount of each should be entered when used, and prices obtained perhaps once a month or so. When figuring the total income and the total expenditures for the year, it gives a better picture of the family living if the total value of the products furnished by the farm are included under total income received and under total expenditures.

Housing

Date	Item	Interest on mortgage		Repairs and improvements		Taxes and fire insurance		Total	
	Estimate for month								

FIG. 77.—Form for recording housing expenditures

A Simple Record to Keep

A record of expenditures in this form is simple to keep. All the expenditures for one class of items are listed together. This classification is essential, for after all the reason for keeping a record of expenditures is not only to see what has been spent and what has been received in return for the money, but to see whether the family is having as many as possible of its needs and desires satisfied. This can be learned only by studying the different kinds of expenditures in relation to each other. The family must be able to see what they have spent on food, clothes, recreation, and so on, in order to determine whether or not they are getting their money's worth and are making the wisest division of their income among their many needs.

CHASE G. WOODHOUSE.

EXPLORER for Alien Plants Runs Many Risks in Far Lands

In a broad sense the agricultural explorer is as old as history. Man, when dissatisfied with his diet of wild roots, berries, and seed, casts about for something better, something more to his taste. He became an explorer, a plant hunter. Our modern agricultural explorer, however, is a creature of the last quarter of a century. He came into being in the

United States Department of Agriculture. He is a man who goes out into the little-known parts of foreign countries seeking new crop plants that he may send back as immigrants to the United States. It is a fascinating job filled with romance and adventure not without danger, but often rewarded with the realization that something has been accomplished for the good of the human race.

Let us follow one of these explorers and see how he works. We find him first in the department at Washington consulting with crop specialists, and familiarizing himself with the details of quarantine laws and regulations so as to safeguard the country against the possible introduction of dangerous pests along with his crop plants. We also find him assembling stores of packing material, labels, and tags for identification, cameras and photographic supplies, and camp equipment. Later we observe him arranging for passports, letters of credit, letters of introduction to foreign scientists and foreign workers in order that he may obtain their help. Finally he will be found bringing together all possible information regarding the crops to which he will pay special attention in his travels abroad.

Broad Training Necessary

These things presuppose broad training in agriculture and horticulture, knowledge of foreign languages, botany, and plant geography. A prerequisite knowledge of how to collect, handle, and pack living plant material is needed so as to have it reach the Department of Agriculture alive. A dead plant immigrant is of no use to anyone, except possibly the specialist who may find a live bug upon it.

FIG. 78.—An agricultural explorer starting on a trip into strange regions

Next we find our agricultural explorer at a little outpost of civilization 500 miles or more in the interior, say, of China. He has run the gantlet of the customs officials; he has gathered about him a little band of native helpers; he has his caravan, and his great adventure is about to begin, for to-morrow he starts into the unknown and unexplored mountains in search of pears and chestnuts that may help his countrymen fight the dreaded fire blight of the pear and the chestnut-bark disease. (Fig. 78.)

After weary days of travel and not a few exciting adventures, he comes to the pear and chestnut country, where he collects seed. In the midst of this work his camp is raided by bandits and he himself is stood up to be shot; but fortune favors him, and he escapes with his life and his beloved pear and chestnut seed. Weeks and months are spent in cleaning, packing, and getting the seed to an outpost

where he must risk the uncertain mail service of the country. (Fig. 79.) At last he sees his treasured packages off on a little river boat or possibly by camel pack, and then he is ready for the next task; and so on through the years, until the lines of his travels on a map of China are almost as numerous and tortuous as the lines of her principal rivers.

Many Tasks for Explorers

There are many other kinds of agricultural explorers. Some take short journeys and others take longer ones. Some plant explorers strike directly into the wilds, and some select a strategic point near a city or town where the country round about is strictly agricultural and where the crops may be carefully studied in the hope of finding new cereals, sorghums, soy beans, forage crops, and shade, windbreak, and ornamental trees and shrubs.

The harvesting and packing for shipment of dry seed is not the most difficult of the explorer's tasks. It is living material, like scions and cuttings, that taxes his skill. Always there is the specter of some new pest that he may unconsciously pass along with the things he thinks worth while. He realizes that he must send his plants in clean or run the risk of some beloved plant being sacrificed for the good of the country. Fortunately, with careful inspection and quarantining as carried on in Washington, most plant immigrants can be saved. Often it may be just a single bud or a small cutting, but that is enough to set the wheels of propagation going.

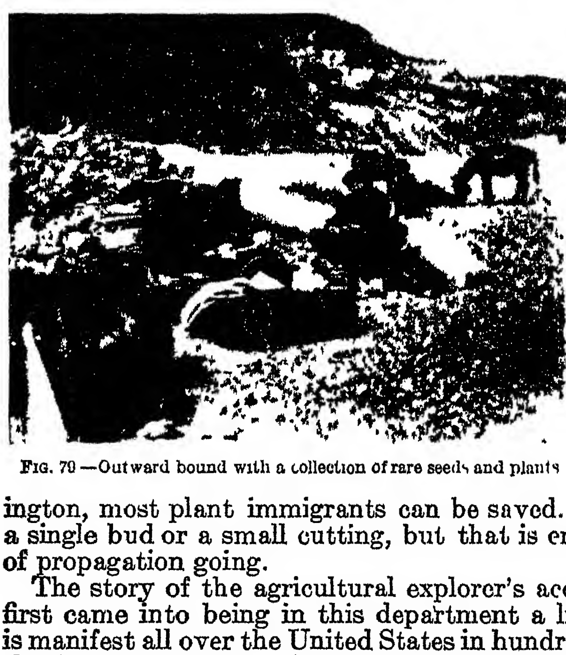

FIG. 79.—Outward bound with a collection of rare seeds and plants

The story of the agricultural explorer's accomplishments since he first came into being in this department a little over 25 years ago is manifest all over the United States in hundreds of plant immigrants that have made good. It was early found that in order to systematize the work, it would be necessary to identify and inventory all plant immigrants. We must know where they come from, when they were discovered, and who discovered them. We must know also what diseases or insects were brought in with them, if any, and how such diseases or insects were treated on arrival; that is, whether it was necessary to fumigate or treat with fungicides. As this is written, our last inventory number is 74,685. That is the size of our plant immigrant family and it is growing at the rate of about 4,000 numbers a year.

On turning back the pages of our inventories, we find a few old numbers representing a group of Russian wheats sent in by one of the agricultural explorers more than 20 years ago. These same

durum wheats have builded a new cereal empire in the Northwest, the annual money value of which would go far toward taking care of the department's entire yearly budget of something over $44,000,000 for regular work.

But the agricultural explorer must leave the money values and crop yields of his finds to those expert in such matters. He looks beyond the horizon, seeking other regions to explore, for he knows that every new worth-while crop plant brought to his country may mean added health, wealth, comfort, and pleasure to our people.

B. T. GALLOWAY.

FAMILY Living Among Poorer Farm People Studied Statistically Some of the poorer farming sections of the United States are presenting problems of increasing interest to American agriculture. Among the most important of these problems are the contributions made by farm families of these sections to commercial agriculture, and the kind of living they get from farming and from other sources.

Three hundred such families were studied in southeastern Ohio for the year ended March 31, 1927. Three localities were included which are typical of much of the hill land drained by the Ohio River and its tributaries—one each in Vinton, Jackson, and Meigs Counties. The topography grades from rolling to very steep and is often rocky. The land is only fairly productive, and is comparatively low priced. Aside from "through" routes, the greater part of which are now being built, roads are hilly and unimproved and railroad points and trading centers are reached with difficulty, especially during the winter and spring.

Work on State and county roads, in brick and tile factories, in the coal mines and oil fields, and at sawmills, furnishes part-time employment for many of the men and boys who live on the farms. Occasionally store-keeping, school-teaching, or county office work supply a considerable part of the family income. Some of the farmers have given up commercial farm operations to work in the industries and trades and are using their farms primarily as places to live.

Approximately one in five of the farms which were in operation a generation ago are now used as places to live, and their production is limited to milk, meat, eggs, garden crops, and other supplies for home use. The rest of the land lies idle except as rented to neighboring farmers, primarily for pasture.

Abandoned Farm Homes

About one in four of the farmhouses of a generation ago have been abandoned. Some have been removed. The land lies idle for the most part. About 60 per cent of the farms of a generation ago are retained for farming and are included in this study.

Information was obtained by the survey method from typical farm families within the localities. There was an average of 3.9 persons per family, excluding relatives, hired helpers, and others, and 4.3 persons including these. The average size of farm was 130 acres, with $4,214 worth of capital invested by the farm operator. Only 6 of the operators were tenants.

The average gross cash income from all sources amounted to only $1,125 per family. Over 70 per cent of this, $804, comprises the receipts from the farm—that is, the gross returns from livestock, crops, wood-lot products, and oil and coal leases. The remainder includes wages of the operator from work off the farm, $188, earnings of other members of the family at outside work, and rents, interests, gifts, etc., amounting to $133 per family.

In addition to the cash income from all sources, family living furnished by the farm, valued at farm prices, amounted to $401 per family, making a total income of $1,526 per family.

Average Cash Outgo

The average cash outgo for all purposes amounted to $1,129 per family. Slightly more than half of this, $580, comprised the farm-operation costs, including current expenses, livestock and machinery purchased, improvements made, and interest accrued during the year. Of the remainder, $532 went for family living purposes; $135 for food, $156 for clothing, $31 for furnishings, $86 for operation goods (including fuel purchased, $24), $31 for the maintenance of health, $46 for advancement goods, $29 for personal goods, $13 for life and health insurance, and $5 for goods not readily classified. The remaining $17 went for debts and interests and expenses on other property, none of which were connected with the farm business.

To complete the family living statement, the $401 worth of family living furnished by the farm may be regarded as an outgo or expenditure, the total value of family living being $933 per family. Goods furnished by the farm include foods, $322; use of the house, $67; and fuel, $12.

If the value of family living furnished by the farm is regarded as an expenditure, the total outgo amounts to $1,530 per family, thereby leaving a deficit of $4 per family for the year of the study. On the other hand, an inventory increase of $69 per family leaves a gain of $65 in net worth for the year.

The size of the income and the size of the outgo suggest that the families here represented are situated in a relatively poor farming section. Unfortunately, figures for comparisons with the more prosperous farming sections are not available in complete sets. Regardless of this shortcoming, figures pertaining to the farm business are available for 1,161 farm families in Illinois, typical of the Corn Belt and ordinarily regarded as a relatively prosperous farming section, and figures pertaining to family living expenditures are available for 1,439 families of the North Central States primarily the Corn Belt section.

Returns in Illinois

The farms in Illinois averaged $4,398 farm receipts and those in southeastern Ohio, $992. The farm expenses in Illinois were $1,987 per farm, those in southeastern Ohio, $580. After subtracting the expenses from the receipts, the farm incomes for the respective sections were $2,411 and $412, almost six times as much income was left from the farm business for the living of the farmer and his family from the farms in Illinois as from those in southeastern Ohio.

The family living expenditures for the farm families of the North Central States, averaging 4.3 persons each, amounted to $1,613

worth of goods during a year, in comparison with $933 worth of goods used by the southeastern Ohio families. Slightly more than two-fifths of the family living was furnished by the farm in each instance, the value of purchased goods being $532 for the southeastern Ohio families and $942 for the Corn-Belt families. The southeastern Ohio families used less of all of the principal groups of goods than did the Corn-Belt families. This applied especially to clothing, maintenance of health, and advancement goods.

The figures here presented, while indicating a low level of farming and family living, do not indicate how near farming in the section approaches the bottom levels of agriculture. Additional studies of a similar nature are needed in other of the poorer farming sections.

E. L. KIRKPATRICK and
H. W. HAWTHORNE.

FARMERS' Elevators in Spring Wheat States Face Problems The department is making a five-year study of the organization and operating methods of farmers' elevators in the spring wheat area in cooperation with the States of Minnesota, North Dakota, South Dakota, and Montana, to determine the factors making for the success or failure of farmers' elevators. Data have been obtained covering the organization methods and business practices of selected groups of farmers' elevators for the three fiscal periods of 1924–25, 1925–26, and 1926–27, and preliminary reports are being published.

One of the most pressing of the major problems of these farmers' elevators is to obtain sufficient volume of business to permit operation at an economical unit cost. Farmers' elevators in this area usually have fixed overhead expenses adapted to an annual volume of business considerably in excess of what they now receive.

Possibilities of increasing the average annual volume of grain handled per elevator are not promising except in instances where consolidation of local companies is possible. On the contrary, in most parts of the spring wheat area there is a gradual tendency to cut down the acreage of small grains marketed, in the interests of diversification. To offset reduction in volume, farmers' elevators as a whole have increased the number and volume of side lines handled. Coal, feed, oils, and other supplies, and grinding and seed cleaning, have helped materially in utilizing available space and labor and have tended to increase annual incomes.

A second problem, developed during the last few years, is the difficulty which managers have experienced in accurately determining qualities and values of grain offered. This is caused by market fluctuations in premiums paid for specific qualities of grain and by the difficulty of determining at the local elevator the protein content, and quality of wheat. Losses through discounts for grain that contains excessive moisture have also been sustained by local elevators, inasmuch as many elevators are not equipped with moisture testers.

Getting Protein Premiums to Farmers

Because of these conditions, it has been difficult at times to closely reflect market values of grain back to producers. This has caused serious disaffection on the part of some members of local farmers'

elevators and has resulted in an increase in the amount of grain marketed by other methods. If premiums for protein continue to fluctuate widely, and if protein content and quality continue to vary widely within limited areas, it is probable that methods will have to be worked out by which farmers' elevators may reflect such premiums to farmers more accurately than is done at present. Furthermore, the more general installation of moisture testers would assist materially in reducing losses caused by unknowingly receiving grain of improper moisture content for storage or marketing.

A third problem is the matter of reducing risks from market price fluctuations on purchased grain unsold, or on sales of grain not yet purchased from farmers. Local elevators usually attempt to eliminate such risks by hedging with futures, but only a few farmers' elevators keep closely hedged at all times. They are usually "long" on the market through failure to sell enough futures to cover grain purchases. Consequently, some elevators sustain severe losses in seasons when the market reacts unfavorably. Experience of managers has shown that such losses can be largely eliminated by keeping accurate daily records of market position and by hedging accordingly.

Again, the study has shown that "spreads" between prices of cash grain and futures used in hedging have caused serious losses to farmers' elevators at times. Such losses were greatest in the hedging of stored grain shipped out and sold but as yet not purchased from farmers. Experience of managers indicates that losses from such spreads may be reduced by care in the selection of futures used in hedging and by keeping stocks of grain on hand to cover sales of stored grain.

These appear to be the most important problems at present. Some managers have succeeded in solving all or part of these problems. Study of the experience of these managers would assist other managers to bring their elevators to a higher level of business efficiency.

W. J. Kuhrt.

FATS Prevented by Simple Precautions from Turning Rancid

Primarily, the development of rancidity in fats, like the drying of linseed oil, is caused by the action of atmospheric oxygen, although it is hastened by light, heat, and the presence of metals. While the first events in the process are not apparent to the senses, the keeping quality of a fat suffers progressively with increasing exposure to air, until a point is eventually reached where the fat acquires a disagreeable, tallowy, penetrating odor and a corresponding flavor. Such a fat is "rancid," as distinguished from fats that are sour or putrid. It is probably a mistake to assume that a slightly rancid fat is but slightly spoiled, for in this condition it has already passed through most of the changes leading to pronounced rancidity.

Result of Feeding Experiments

Rancid fats are unpalatable and render unpalatable other foods with which they are combined; and, being unsound, they have from the outset been classed as inedible and condemned by the Federal meat-inspection service so far as its jurisdiction extends. More

recently, in experiments conducted by the Bureau of Animal Industry, the wholesomeness of rancid fats also has been studied by feeding intensely rancid lard, in an otherwise adequate ration, to white rats and comparing their condition with that of other rats receiving a similar ration containing fresh lard. It appeared that the rancid lard in itself was not particularly harmful to the rats; but when it was kneaded together with the other constituents of the ration, the ration very quickly became inadequate, as evidenced by the retarded growth, sickly condition, diseased eyes, and early death of the rats that received it. The rancid lard evidently had destroyed the vitamin A of the ration.

Ways to Prevent Rancidity

While these results may find an application in animal feeding, our chief interest in rancidity from a human point of view lies in its prevention. Obviously, measures with this end in view should be directed toward the raw material as well as the finished product, and will be successful in proportion as they serve to restrict the action of oxygen upon the fat. Complete protection for an indefinite time may be assured by holding fats in cans that have been sealed in a vacuum or in completely filled containers with air-tight covers, such as fruit jars. In some cases, as in pails of lard, the fat itself no doubt may serve to seal the cover thus reducing exposure of the fat to a minimum.

Where exclusion of air is impracticable, as in case of raw fat awaiting the rendering kettle, or opened packages in the home or retail store, or where such a precaution might be burdensome, as in the case of commercial products intended for prompt consumption, it should be remembered that refrigeration and darkness are important means of retarding the development of rancidity, while heat, light, and contact of the fat with uncoated metals serve to hasten the process in fat exposed to the air. Under adverse conditions a fat may become rancid in the course of a few hours.

Commercial establishments knowing these facts are careful to regulate their practice according to these principles, thereby practically eliminating losses due to rancidity. By suitable application of the same principles, scrupulous cleanliness being presupposed, rancidity may also be avoided in the retail store, in the kitchen pantry, and in stocks of home rendered lard.

W. C. Powick.

FERTILIZER Obtainable from Offal of Farm Slaughtered Animals Every year, about 19,000,000 head of cattle, calves, sheep, and swine are killed for meat on the farms and ranges of the United States, according to the census statistics. Beside the edible parts and the hides or pelts, there is produced from these animals an enormous quantity of inedible offal and blood, amounting in the aggregate to probably a third of a million tons. The sanitary and advantageous disposal of this inedible refuse on the farm has long been a problem.

In the butchering of animals on the farm, the quantities of offal and blood obtained in any one place are usually too small to justify the undertaking of steam rendering for the production of commercial

fats and tankages. Often the refuse is buried deeply (a laborious method of disposal), resulting in a total loss of the material. Or, more commonly, the offal is fed raw to hogs, a practice which is objectionable, since the offal from diseased animals, or those infested with parasites, becomes a menace to the health of the animals feeding thereon. Furthermore, this practice usually results in attracting rats, and is conducive to the breeding of flies.

The following suggestions are based on experimental work conducted in the department with the view to developing simple and safe methods for utilizing the offal and blood on the farm.

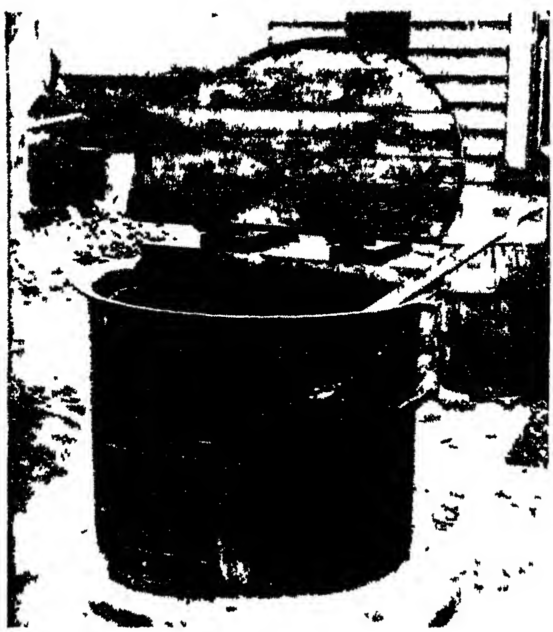

FIG 80 – A 65-gallon caldron or kettle-cooker in its stove Such an outfit, costing about $20 at the factory, can be used for rendering offal, as well as for cooking feed, scalding hogs, and making soap

Open-kettle rendering of offal and cooking of the shed blood, is ordinarily feasible on the farm. A 65-gallon caldron, or open-kettle cooker with stove complete, as shown in Figure 80, can be purchased for $20 or $22, f. o. b. factories in Michigan and Ohio. By boiling the fresh offal for several hours, wet "tankage" that is safer than the raw offal for direct feeding to hogs may be obtained; and also considerable grease of some commercial value. The bulk of the manure can be eliminated by chopping up the offal and sluicing it with water. The blood recovered from the slaughtering can be cooked with the offal.

Mixing with Preservatives

It has been found feasible to prepare air-dry fertilizer material from the wet "tankage," and even from the hashed raw offal, by mixing it with simple preserving agents and allowing it to dry in the air under shelter.

Freshly crushed quicklime gives fair results as a preservative to use during winter. A mixture of quicklime and the wet tankage which is produced by the open-kettle rendering of sheep's offal, will dry during the winter to an inoffensive product that may be easily ground to a meal. One pound of quicklime may be used for every 10 pounds of tankage. The air-dry product contained 6 per cent of ammonia, and 11.2 per cent of bone phosphate.

Ordinary commercial acid phosphate gives the most promising results of any of the preservatives tested. A mixture of moist "tank-

age" made from hogs' offal, with 1 pound of 16 per cent superphosphate (acid phosphate) to every 3 pounds of the tankage, dries in midsummer without becoming offensive. In the test, the mixture was spread out in a shallow box and raked over frequently. Four weeks after mixing it was in condition for grinding and bagging. The product contained 2.8 per cent of ammonia and 7.6 per cent of available phosphoric acid (P_2O_5).

In preserving raw offal or blood with acid phosphate, it is advisable to use more of the preservative (about 4 pounds for every 10 pounds of the hashed offal or blood) and to include some nonalkaline absorbent material, such as dry chaff, peat, or gypsum, to keep the compost from becoming fluid. By insuring a sufficiently high acidity, putrefaction and the breeding of flies may be avoided.

This composting process may also prove useful in rural districts for converting other perishable refuse into material that can be stored and used as fertilizer.

G. P. WALTON.

FERTILIZER'S Utility Much Affected by Its Mechanical Condition The production of fertilizers in this country at present amounts to about 7,500,000 tons annually. The materials used in their manufacture are of varied composition and come from many different sources, but all may be grouped into two classes according as their origin is mineral or organic. The most widely used mineral fertilizers are superphosphate (acid phosphate), nitrate of soda, sulphate of ammonia, and the potash salts. The best-known organic fertilizers are cottonseed meal, dried blood, tankage, and fish scrap. These materials are similar to barnyard manure, in that they are insoluble or only slightly soluble in water and undergo little or no change in physical properties when exposed to damp or humid conditions. The mineral fertilizer materials on the other hand, are all more or less soluble in water and many cake or become sticky when exposed to moisture or a humid atmosphere. This condition is a serious disadvantage to their use in fertilizers, as it greatly interferes with their distribution in the field.

According to the most commonly expressed view, the burning effect of fertilizers is due to the soluble materials which they contain. If their distribution is irregular, as necessarily occurs when they are sticky or caked, the quantity applied in the neighborhood of certain seeds may be sufficient to delay or prevent germination, while others may be insufficiently fertilized for best results. The response which a crop makes to a fertilizer is thus not only dependent on the composition of the fertilizer, but also on its mechanical condition and the uniformity of its distribution in the field.

The organic ammoniates used in fertilizers are all obtained as industrial by-products, and the supply can therefore not be increased independently of the principal products. This restricted production and the competition of the feeding industry have greatly limited the available supply, so that the quantity used in fertilizers has decreased and is likely to continue to decrease from year to year. As a means of maintaining the nitrogen supply, a great deal of attention is now being given to the production of fixed-nitrogen products, materials which contain nitrogen that has been fixed from the air. The fixed-nitrogen materials, however, are readily soluble in water, and in

this way they differ from the organic ammoniates which they are intended to replace. This tendency towards the greater use of soluble materials in fertilizers will increase the difficulty of their handling and distribution unless corresponding improvement is made in their drillability and storage qualities. The question of the mechanical condition of fertilizers is thus becoming a problem of increasing importance in their manufacture.

Caking of Fertilizers

The cause of caking in fertilizers may be very different in different materials, but it is usually associated with the presence of moisture. All soluble materials have the property of taking up moisture from the air when the relative atmospheric humidity exceeds a definite value. Some soluble materials, however, do not take up moisture at ordinary humidities, and thus they remain dry. Other materials absorb moisture from the atmosphere at ordinary humidities, and are said to be hygroscopic. It thus happens that a material or mixture of materials may become moist and cake even when stored in a perfectly dry condition.

The presence of moisture may induce caking (1) by causing the material to "set," as in plaster of Paris, (2) by forming a sticky liquid layer over the surface of each soluble particle, and (3) by causing the separate crystal particles to grow together into a solid mass.

The rate at which all these changes take place in any given material increases with the fineness of grinding. Fine grinding has an additional effect on the mechanical condition of a fertilizer, in that very fine particles cling to each other. A finely divided material therefore has the property of bridging over a small opening, so that its flow through a fertilizer drill is less uniform than one in which the particles are of larger dimensions.

Improving the Condition of Fertilizers

The best known example of "setting" in a fertilizer is that of superphosphate. When the setting is complete no further action takes place and the original mechanical condition of the material may be restored by grinding. This treatment, however, has no permanent effect in improving the mechanical condition of materials which cake for any of the other reasons mentioned. The most effective treatment in such cases will depend on the cause of caking and may consist in (1) reducing the hygroscopic properties of a material by chemical treatment, (2) mixing with insoluble materials, and (3) preparing the product in the form of uniform-sized grains, which thus eliminates the form of caking due to the presence of fine particles.

A number of inorganic materials, such as ordinary and triple superphosphate, which are slightly soluble in water, show little tendency to cake in a pure state but may become sticky and difficult to handle because of the presence of hygroscopic impurities, such as free phosphoric acid. Such impurities are now being rendered inactive by new methods of manufacture and by neutralizing the free acid with lime or by other treatment. The improvement which has been made in the mechanical condition of phosphate materials has compensated in a large measure for the decreased supply of organic conditioners

and is one of the important developments which has recently taken place in the fertilizer industry.

Certain of the fixed-nitrogen products which contain nitrogen as the only fertilizer constituent are the most hygroscopic materials known, and any treatment for their improvement must be applied to the whole product. This improvement may be most successfully accomplished by causing them, in the process of their manufacture, to combine with certain other fertilizer products to form fertilizer materials which contain two plant-food elements, such as phosphate of ammonia and nitrate of potash. These materials are all of good mechanical condition and are among the least hygroscopic of soluble materials.

Soluble materials which show little tendency to absorb moisture from the air are usually in good mechanical condition, but many frequently cake, owing to the characteristic property of their individual particles to stick together. Caking of such materials may be easily and permanently prevented by mixing with a powdered insoluble material such as peat or cottonseed meal. The finely divided particles of insoluble material adhere to and form a coating over the more sticky surfaces of the soluble particles. This coating largely eliminates the sticking properties of the mixture and its mechanical condition is thereby greatly improved. The use of the organic ammoniates as conditioners in fertilizer manufacture is a practice of long standing in the fertilizer industry.

Fertilizers which contain two plant-food elements contain a higher proportion of plant food than equivalent mixtures of single constituent materials. Their bulk per unit of plant food is therefore less than for corresponding mixtures of lower grade materials, and the quantity of an organic ammoniate needed to give the same conditioning effect will likewise be correspondingly less. The fixation of nitrogen in the form of two fertilizer constituent materials thus affords a means of conserving the organic ammoniates required as conditioners in fertilizer manufacture. If present theories are correct, danger from burning, when these high-grade materials are used, will also be decreased in proportion as their content of soluble materials per unit of plant food is less than in mixtures of low-grade materials.

WILLIAM H. ROSS and
ALBERT R. MERZ.

FIRE Loss on Farms $150,000,000 Property and 3,500 Lives a Year

It has been estimated that farm fires in the United States annually take a toll of 3,500 lives and cause a property loss of $150,000,000, as compared with an estimated yearly loss of 15,000 lives and $570,000,000 in cities and urban districts.

With fire-loss statistics of the National Board of Fire Underwriters as a basis, it can be computed that the annual increase in property loss from rural fires is about three times as great proportionately as that from urban fires. In considering this increase, attention should be given to the fact that the burning ratio, and not the annual loss, is the true index of the situation. The burning ratio for farm property, because of inadequate fire protection, is high for the class of risk involved, and the annual loss of life and property from farm fires is

of such magnitude as to call for increased and unceasing efforts to curtail it. This deplorable wastage is even greater than the figures show for the reason that food supplies are destroyed, farm families are rendered homeless, gainful productive operations on the farm are interrupted, and even suspended, and potential manufactured products are lost. This waste is essentially needless and could be prevented to a very large extent by carefulness and the adoption of equipment and methods which have proved effective in preventing fires.

Farm Fire Work of the Department

The Department of Agriculture is making a special study of the causes of farm fires with a view to developing methods for their control and prevention. Active cooperation is being received from prominent organizations, such as the National Fire Protection Association,

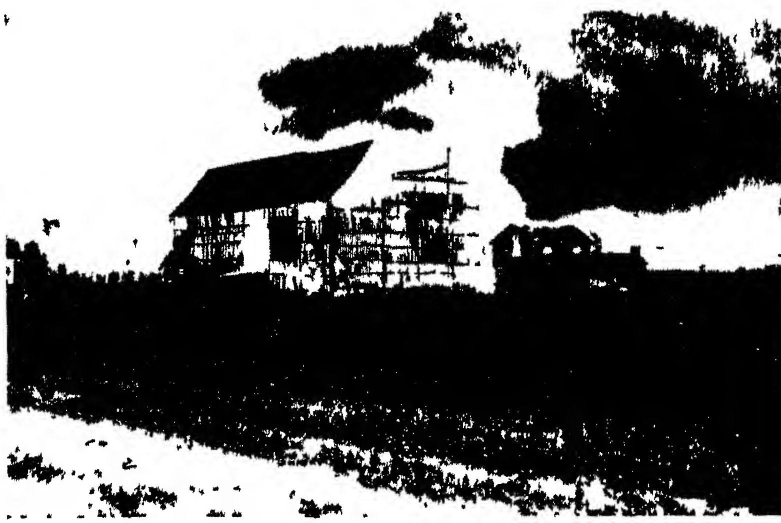

FIG. 81.—A barn and near-by buildings fired by lightning

the National Board of Fire Underwriters, the Chamber of Commerce of the United States, the various farm organizations, and many other interested national agencies.

The National Fire Protection Association has created a committee on farm fire protection, the chairman and three other members of which are representatives of the Department of Agriculture. This department is also represented on the agricultural committee of the National Fire Waste Council, and the farm fire prevention and protection committee of the American Society of Agricultural Engineers.

In the approximate order of their national importance, and without regard to geographic division of the country, the principal causes of farm fires are (1) lightning (fig. 81), (2) defective chimneys and heating apparatus, (3) careless use of matches and smoking, (4) combustible roofs, (5) spontaneous ignition, (6) careless use and storage of gasoline and kerosene, and (7) faulty wiring and improper use of electrical appliances.

Means for Preventing Fire Loss

All buildings should be equipped with a system of lightning rods, and wire fences inclosing livestock should be grounded in accordance with the safety code for the protection of life and property against lightning of the National Fire Protection Association. The farm fire protection committee of this association has made the following statement concerning protection from lightning:

The annual farm property loss from lightning may be estimated at $20,000,000 as a minimum. The annual number of people on the farm killed by lightning is between 400 and 500, and the number of such persons injured from this cause is more than twice the number of deaths. Available statistics indicate that lightning rods, both good and defective, as hitherto found on farm buildings, have reduced lightning losses by about 85 per cent of the loss incurred from lightning on corresponding exposures of unrodded buildings, and that properly installed and well maintained rods have shown an efficiency in the prevention of lightning damage of well-nigh 100 per cent

FIG 82.—A farm fire generally does a thorough job of destruction

A substantial metal roof with all parts thereof in good electric contact can, according to available evidence, be utilized as a part of the lightning protection system for a building and thus in part be made to serve a double purpose. The cost of grounding the roof and making other necessary electrical connections is relatively small.

Defective Chimneys and Heating Apparatus

Chimneys should always be built from the ground up and should not be used to support any part of the house. They should be substantially constructed with walls at least 8 inches thick. Defective chimneys should be rebuilt and faulty heating apparatus should be repaired. Stoves should rest only on substantial fire-resistant bases and should be kept at safe distances from wooden floors, walls, and woodwork. When stovepipes are passed through walls or ceilings, a ventilating thimble of ample size should be used. Chimneys and flues should be cleaned frequently, and ashes should be kept in metal cans, never in wooden boxes, barrels, or on combustible floors.

Smoking should not be permitted in barns or near combustible materials. Safety matches only should be used, and they should be kept away from children. A commendable practice is to break a match in two after it has been used.

Fire-retardant roofing should be used whenever possible as the fire hazard of the combustible roof is a serious one.

Spontaneous Ignition

Improperly cured or damp hay, grain, feed, and horse manure, when stored in large piles are subject to spontaneous heating, and if conditions are favorable this heating will progress until spontaneous ignition occurs. This phenomenon is due to microorganic and chemical action. Even though the heating abates before dangerous temperatures are reached, the resulting deterioration of the materials involved represents a staggering loss. The Department of Agri-

FIG. 83 —Forty-seven head of valuable cattle killed by a single bolt of lightning

culture is now undertaking a thorough study of the problem of the spontaneous heating and ignition of hay and other agricultural products. The project calls for the devising of preventive measures and equipment.

In the absence of specific information on effective methods to prevent losses from this cause it is generally recommended that (1) hay be properly cured before storage, (2) salt be added to damp hay as it is placed in the barn or in stacks, and (3) hay be ventilated as freely as possible after storage.

Waste and rags saturated with linseed and similar oils are also subject to spontaneous heating and ignition, and should be either burned immediately or placed in metal receptacles.

Gasoline and Kerosene

Gasoline and kerosene should be handled with extreme care. If it is impracticable to place these liquids in underground tanks, they should be stored in original containers in an isolated location. They

should never be used to quicken or revive a fire. The use of gasoline in cleaning operations in the home is an extremely hazardous one and should not be undertaken.

Use only a wiring system which meets the requirements of the national electrical code. Always disconnect electric appliances when not in use. Paper shades in direct contact with lamps constitute a fire hazard.

Fire-protection apparatus on the farm should consist of ladders and chemical extinguishers and either water pails or tanks equipped with pumps. A water-pressure system affords desirable protection.

Rural-community fire protection is of the utmost importance. Every community should have adequate motor fire apparatus, a trained volunteer fire department, and some cooperative arrangement for the purchase, installation, and maintenance of effective lightning rods.

Farm-fire prevention and protection merits the national attention and consideration it is now receiving, and the Department of Agriculture gladly offers its services in meeting this important problem.

David J. Price and
Harry E. Roethe.

FIREWOOD Should Be Seasoned; Proper Storing Helps Drying A piece of wood will throw out less heat if burned green than if dried first. Green wood, of course, may be preferred for fuel when it is desired to keep a low fire for a long time, but as a rule the practical advantages of having firewood well dried are unquestioned. After cutting firewood, therefore, the first object is quick drying.

In order to dry wood as fast as possible, it is necessary to expose it to sun and wind and protect it from rain. The piles should be as narrow and as open as possible, so that what wind there is may blow freely through them. The cords near the bottom of the pile usually dry more slowly than the others, particularly if the pile rests directly on the ground. A raised support for the pile is therefore very desirable. Any temporary roof or cover to keep off rain will help to produce faster drying.

Wood piled in a closed shed usually dries more slowly than that piled in the open. Woodsheds would be better if they were built open or slatted for a foot or so above the floor, so that the lower layers of wood could receive good circulation. This would dry the wood better and would also help to prevent decay of both shed and wood.

Rolf Thelen.

FLAX Resistant to Wilt and Sown Early Helps to Cut Losses The flax crop is being made safe from diseases by cooperative experiments in devising cultural practices which will reduce loss from diseases and increase acre yields and in breeding wilt-resistant and rust-resistant varieties of seed and fiber flax.

Flax has been one of the most profitable farm crops in Minnesota, the Dakotas, and Montana during the last five years. It will be still more profitable when diseases are controlled better.

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Wilt and rust are the most destructive diseases of flax. Wilt once was the limiting factor in flax production. Fortunately, however, wilt-resistant varieties such as North Dakota 114, Winona (Minnesota No. 182), Chippewa (Minnesota No. 181), and Redwing (Minnesota No. 188) have been developed and are now grown extensively. These varieties are not immune from wilt, but they are sufficiently resistant to escape severe damage when sown early. Unfortunately, most of these wilt-resistant varieties are susceptible to rust, which is very destructive in some years.

Flax rust causes greater damage to both seed and fiber flax than is generally realized. In years when rust is epidemic it may reduce yields as much as 25 per cent or more. The disease is caused by one of the rust fungi (*Melampsora lini*) which attacks cultivated flax and at least one kind of wild flax. It is most destructive to late-sown flax and in years when the weather is moist. All stages of the rust fungus are produced on flax. The most conspicuous stages are the red or summer stage and the black or winter stage. The black stage persists during the winter on stubble and straw and also may be carried on bits of straw and chaff with the seed. It again starts the rust in the spring.

How Losses May Be Reduced

Flax growers can reduce losses from wilt and rust by methods already available, namely, by growing wilt-resistant varieties and planting clean seed and by soil selection, crop rotation, and early seeding. First of all, wilt-resistant varieties should be used. North Dakota 114, Chippewa, Winona, and Redwing all are resistant. The seed should always be cleaned thoroughly, because light, shriveled seeds often carry the wilt fungus, and rust is often carried on bits of straw and chaff. The selection of land is important; rust is likely to be most destructive on low land where air drainage is poor. Flax should be grown in rotation, because the wilt fungus persists in the soil for many years, and the rust lives over winter on stubble.

Early sowing will reduce damage from both wilt and rust. None of the wilt-resistant varieties are immune. They may wilt rather badly if soil temperature is high while the plants are young, because the fungus which causes wilt grows best at a rather high temperature. Early seeding also helps to reduce the rust menace, because rust usually does not become very destructive until late in the season, and early sown fields may ripen early enough to escape severe injury.

The greatest hope for reducing disease losses still more lies in the production of superior disease-resistant varieties. There already are wilt-resistant varieties and a few rust-immune varieties of seed flax. No variety of seed flax combines wilt resistance and rust resistance with other most desirable qualities. Certain Indian and Argentine varieties are immune from rust, and some of the same Argentine selections are also resistant to wilt, but most of them are so short as to be unsuited for growing in this country. These resistant strains have been crossed with some of the better wilt-resistant varieties of seed flax in the hope of obtaining hybrids which will combine all of the desired characters. Numerous hybrid selections from these crosses appear to have the desired characters.

Disease-Resistant Varieties

Rapid progress is being made in breeding disease-resistant varieties of fiber flax as well. Most of the best varieties of fiber flax, such as Saginaw, are very susceptible to rust. No rust-immune fiber flax is known, Ottawa 770B being the nearest approach to it. Saginaw has been crossed with Ottawa, a semifiber type, and with Argentine and certain other rust-immune seed types in order to obtain hybrids with the qualities of a fiber flax and immunity from rust. Some of the resulting hybrids have the rust immunity of the seed-flax parent combined with good fiber qualities.

Most of the varieties now known are either fiber types or seed types. The fiber types usually yield but little seed, while the seed types do not produce good fiber. The breeding experiments indicate that it may be possible to combine both qualities, at least to a certain degree, in one variety. The advantages of such a variety are obvious, particularly for a region in which flax is grown principally for seed. No seed of the new varieties is yet available for distribution, yet the work has progressed far enough to show clearly that the desired results can be obtained in flax adapted to the moister areas of the present seed-flax region.

E. C. STAKMAN.

FLOOD Relief Work by Extension Service Assisted Thousands The extension service in any State can be quickly converted into an effective emergency force. This was demonstrated in 1927 in connection with the great flood in the Mississippi Valley. Extension workers in the flooded area knew the people, the farms, and the general conditions involved. Further, they were reenforced by supervisory and specialist forces located at the agricultural colleges and in the United States Department of Agriculture. More than a half million people were made homeless in a 20,000-square-mile area of a vast and fertile valley. Whether the distress resulted from quick waters in the foothills of the Ozarks, where 8 inches of rain fell in a single day, or in the lowlands of Illinois, Kentucky, and Tennessee, or in the Delta of Mississippi where the waters steadily rose, or in the sugar bowl of Louisiana where the people had a month's warning before the waters came, the extension agents were on the job to aid in rescue and rehabilitation work. (Fig. 84.) A great contribution of service and facts in action was made by the extension organization.

When the Red Cross entered the various devastated counties and began to organize committees, the extension agents were ready with preliminary estimates of the loss of human life, crops, livestock, and property in general. These agents served as chairmen of the Red Cross committees in a few instances, as members in others, and as advisers in all. They were called upon to make surveys of various forms of damage. It often happened that the first appraisals made by the agents were quite as accurate as the later surveys which required more effort and time. In some instances the relief expenditures ran higher than the careful estimates prepared by agents upon a well-defined schedule basis. They made classified recommendations in regard to amounts of seed, numbers of

chickens, hogs, cows, and mules needed, and also money for furniture and housing.

Seed and Livestock Obtained

With the cooperation of district agents and other staff members and specialists at various headquarters, the agents were able to

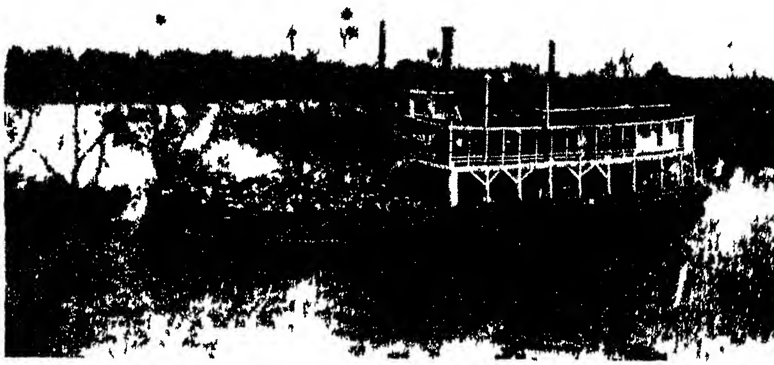

FIG 84—The steamer *Vicksburg* coming in from the plantations where thousands of lives were saved by taking people out of windows and off roofs of houses

locate seed, plants, and livestock, in sections of the country not far from the flooded districts, and to see that such supplies were delivered to the Red Cross at reasonable prices. People generally,

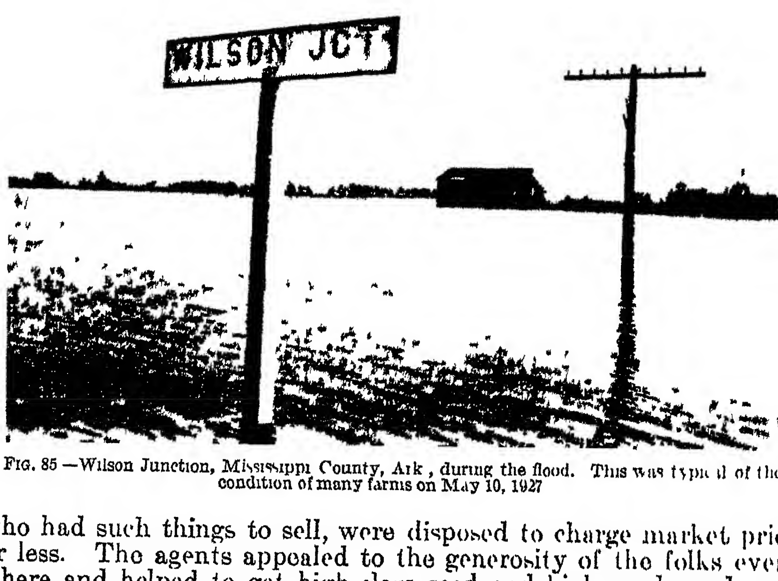

FIG. 85—Wilson Junction, Mississippi County, Ark, during the flood. This was typical of the condition of many farms on May 10, 1927

who had such things to sell, were disposed to charge market prices or less. The agents appealed to the generosity of the folks everywhere and helped to get high-class seed and high grade and purebred livestock for their neighbors in distress. (Fig. 85.)

The Red Cross committees realized that the agents were in close touch with the farming people and in many cases asked them to assume the responsibility of distributing feed, food, fertilizer, and clothing. The effectiveness of the relief efforts for distressed people over such a large area rested largely upon the good cooperation of the Red Cross with all existing forces. The agents often put in long hours and worked efficiently in distributing carloads of donations necessary for immediate relief. In some instances these cars were filled with miscellaneous articles of clothing, household goods and shoes, which had to be distributed with great care. People a few hundred miles from the flooded areas canned vegetables, fruits, and meats and sent them to the sufferers through the Red Cross. They also gathered up other products from people who did not have

FIG. 86 Making clothing in a Mississippi refugee camp Women were organized to make sandbags for levees as well as rugs, curtains, and other household articles

money to give, but who wished to help. The agents at the shipping points and at the destinations directed all the movements of such goods

In the refugee camps, the home demonstration agents were often called upon to plan meals for thousands and even to see that they were cooked properly. These same agents looked after the milk supply and the water supply in order to prevent epidemics of disease. They organized the women and girls into groups and conducted important lines of instruction and work under camp conditions. (Fig. 86.) In one place an agent organized 100 women, who made 30,000 bags for levee work in four days. In camps in other counties the women made rugs, quilts, mattresses, clothing, and other things to be used in their homes when the waters should recede and let them return home. Hundreds of bolts of cloth were utilized in this way.

Agents Directed Removals

In the lower reaches of the Mississippi, where the waters rose more slowly, the agents directed the arrangements for removing people and their livestock, including mules, cows, and horses into the hill country. They also looked after the shipping of thousands of chickens to relieve their owners of their care and to obtain much needed cash. In the same way, service was rendered in canning chickens while they were still in good order, and before the flood conditions made it impossible to feed them. Some chickens and hogs were kept on rafts in high places and men went around in boats and fed them. Bees and honey were saved by having the hives elevated above high water. While some county agents supervised the collection and removal of livestock, other agents far out on the prairies and in the hills directed the feeding, care, and return of these animals. It was necessary to vaccinate in order to prevent cholera and anthrax. (Fig. 87.) In consequence, when the people returned to their homes,

FIG. 87.—Vaccinating 8,000 hogs in a concentration camp in Lafayette, La. County agents had hogs moved out in advance of flood waters

they had the foundation for rebuilding their livestock holdings. One director of extension speaks of the agents as the shock absorbers of the whole flood work.

One of the most helpful forms of relief was that which the home demonstration agents promoted in the matter of housing. By the time the waters began to recede, the agents had the women organized and suggestions for home improvement ready. They proceeded on the theory that to clean up and brighten up the recovered homes was the first step in improving the morale and health of the people. They decided that bathing facilities and a supply of fresh linen would accomplish much. They felt that paint, whitewash, and a few flowers could help to make the people happy in their home life again. Accordingly, they brought to the returned families whitewash recipes, brushes, and practical suggestions for putting in screens, repairing and renewing furniture, and soon had the women and girls happy in their efforts to reestablish their homes. The home demonstration

agents also made up estimates for the Red Cross and found out where the most essential utensils and articles of household furniture could be had at the lowest cost. They did their share, too, in starting the machinery for such replacements. They gave out flower seed as well as vegetable seed in large numbers and followed up the planting of the seed with suggestions on the cultivation and care of both vegetables and flowers.

Putting Man Power to Work

The greatest loss, after the first sweep of the disaster, was in the failure to use the available man power effectively. As soon as the people could get to work restoring their homes and farms, the cost of feeding them decreased and contentment increased. Under such conditions every man with a hammer and saw was an asset. Nails and lime

FIG 88 Soy beans and sorghum grown in Washington County, Miss, after the flood waters receded in June, 1927

were made abundant and available by the forethought of the agents and the Red Cross workers. Good lessons were learned for such work in the future. This experience suggests that when possible relief money be used for wages to people who have lost everything, substituting the pay roll for the bread line.

When the flood waters began to subside in the northern part of the devastated area, early in the summer, officials in the extension service recommended the distribution of garden seed to the Red Cross, and such seed was issued by the Red Cross and used extensively. Good gardens were to be found everywhere. Some gardens were destroyed by second and third floods, but good results were obtained from this expenditure. One agent estimated that every good garden was worth at least $100 in providing food. In the fall, the home demonstration agents instructed women and girls in the conservation of garden products. Gardens helped to keep up the health of the people, as well as to provide food.

In the whole valley, late summer and fall crops were most vital. Circular letters were issued by the extension service of the colleges of agriculture and the United States Department of Agriculture, suggesting what crops should be planted. It was necessary to revise the recommendations as the waters rose and fell. Agents in the counties carried the necessary information to the people and exerted a helpful influence in promoting the planting of soy beans, cowpeas, sweet potatoes, sorghum, small grain, alfalfa, and other crops. (Fig. 88.) They had to be ready at all times with information about insects, plant diseases, and the ills of man and beast.

In some of the counties, where the water remained longest on the farms, the agents, in cooperation with the Red Cross, supervised extensive plantings of truck crops for sale. It was too late to do anything else. The vegetables produced were graded, packed and sold by the local farm bureau exchange and through other channels.

O. B. MARTIN.

FLOODS Disturb the Balance of Nature in World of Insects Thousands of news columns have been devoted to the effect of the 1927 floods in the Mississippi Valley on the human inhabitants and their possessions, but few people realize the great effect of these same floods on the insect population of the valley. The laboratory of the cotton-insect investigations of the Bureau of Entomology, located at Tallulah, La., was in the approximate center of the flooded territory and was only some 4 miles away from the Cabin Teele crevasse, which was one of the major breaks in the levee system. Consequently, the entomologists of this organization have been especially well situated for studying the effect of the floods on the insect problems, and particularly those relating to cotton.

The flooding of the cotton territory started in a large way with the Dorena break in southeastern Missouri, which occurred on April 16. This water covered the southeastern corner of Missouri and then moved southward into Arkansas. This was followed by numerous breaks in Arkansas, particularly in the levee systems on the rivers in Arkansas which drain into the Mississippi, the principal break of this series being the Pendleton crevasse on the Arkansas River, which occurred on April 21. These waters covered southeastern Arkansas and then moved down through northeastern Louisiana, spreading over all territory except that immediately along the highlands on the river front. These lands, however, were almost immediately inundated by the Cabin Teele crevasse near Tallulah and the Winter Quarters crevasse near Newellton, La., both of which occurred on May 3. The waters from these poured southward and covered nearly all of the lowland cotton territory.

Cotton Land Mostly Flooded

The various levees in southern Louisiana failed in rapid succession. On the Mississippi side of the river an enormous crevasse occurred on April 21 at Mounds Landing immediately north of Greenville. The water from this crevasse moved southward to the Yazoo bottoms and spread eastward to the hills, covering all territory from north of Greenville to the hills at Vicksburg. As a result of these breaks

almost all of the cotton land in the Mississippi Valley was flooded except a small area on the east side of the river north of the Mounds Landing crevasse and extending from about Beulah, Miss., to the hills on the Tennessee line.

The depth of water and duration of overflow in this territory varied greatly. The river fell and rose several times, and in those areas subjected to overflow from the Arkansas River breaks there were four separate and distinct overflows. In much of the territory the overflow was comparatively brief, the water being over the land only from two to three weeks; in other sections, however, particularly in the territory immediately around Tallulah, the land was under water for 10 weeks. Naturally, it has been found that the duration of the overflow had much to do with the insect problems following the recession of the waters.

The writer saw these several overflows as the water came over the land. (Fig. 89.) All forms of wild life, including deer, turkeys,

FIG. 89.—Louisiana cotton fields in June, 1927. These fields were in this condition from May 3 until the end of July.

and rabbits, fled panic stricken ahead of the waters, and a closer examination showed that the insect life was making an equally vigorous attempt to escape. The writer had never before realized the enormous population of insects in a small plot of ground until he waded around in fields in which the water was gradually rising and watched these insects crawling upward and gathering on plants in the effort to escape.

Migration of Ants

One of the most interesting sights was the migration of enormous multitudes of ants. Almost every plant was covered with them, and as the water rose they continued to climb until they finally assembled in a ball at the very top of the plant. They had brought along the young and the eggs and formed compact masses, often several inches in diameter, which finally floated away and drowned, as the water reached the limit of their climb. Human habitations in the overflow quickly became veritable hives of insects as those

species which normally lived on the ground moved upward. In spite of this the insects killed were numerous beyond calculation, and the most important effect of all has been the upset in the balance of nature. This has been brought about by the fact that the habits of some species were such that they escaped the overflow successfully, whereas other species were almost completely destroyed.

It has been known for a long time that certain insect pests become abnormally injurious following an overflow, while other species are more or less controlled by the overflow. In some cases this effect is noticed almost immediately after the water has receded, while in others the effect is slower and lasts for several years. Abnormal injury may be due either (1) to the effect of the overflow on the insects themselves or (2) to its effect on the crop attacked. In the first case the insect pests themselves, or their natural enemies, are destroyed, or the native host plants of the pest adversely affected.

FIG. 90.—Indian mounds among Mississippi cotton fields Every such high spot served not only for the people and their livestock but also for a multitude of refugee insects

In the second case the necessary change in planting dates or the absence of wild vegetation which is ordinarily fed upon aggravates attack upon the crop.

A study of the effect of the overflow on any one species of insect must take into consideration all of the foregoing factors. The insect may be so located in its habitat that it is either protected from, or greatly exposed to, the drowning effect of the water. It may escape the water and its natural enemies may be drowned. Its wild host plants may be drowned out, thus preventing the insect from multiplying and subsequently transferring its attack to its cultivated host. On the other hand, a loss of wild host plants may force an abnormal attack on the cultivated host. The change in the planting season of the crop exposes it to an entirely new set of insect conditions; furthermore, in many cases the absence of wild vegetation in and around the fields has caused undue injury to the cultivated

crop because no other food was available for species having promiscuous food habits. The effect of the flood on the principal cotton insects as observed during 1927 may be summarized briefly.

Cotton Boll Weevils Destroyed

A large proportion of the boll weevils seem to have been destroyed in the flooded districts. However, scattered throughout these districts there were small protected places or high ridges with a few acres of cotton which were not overflowed. These served as concentration points for early weevils. The later cotton planted after the overflow was only very lightly infested until migration started from territory outside of the overflowed area. Since then the increase of infestation has been exceedingly rapid and in the aggregate the production of cotton in the overflowed area has been negligible. The oldest fields received a concentration of the weevils that survived the flood, and the fields planted later did not have time to mature a crop before they were completely infested by migrating weevils from territory that was not overflowed. As a matter of community value, it would undoubtedly be better if there were no cotton whatever in the overflowed area, for a large proportion of the fields are merely serving as breeding grounds to produce a weevil infestation in 1928.

The bollworm is not ordinarily of major economic importance in the overflowed area in the Mississippi Valley, but this year it has done greater damage in many sections than any other pest. In the first place, the natural enemies seem to be greatly reduced and the species has been unusually abundant. Furthermore, in a normal year this species prefers corn to cotton and confines its attention very largely to cornfields until the corn is mature. By that time the cotton crop is well fruited and damage to cotton consists only in the eating out of the contents of a portion of the bolls.

Following the overflow, however, there was practically no corn available and these worms concentrated their attack on the cotton. Bolls had not yet formed, and as a result the worms ate out the contents of the squares and, in extreme cases, even fed on the foliage of the plants. A single worm would thus ruin a large number of squares, the normal destructive capacity per individual being much increased. Furthermore, this insect multiplied to such large numbers in the overflowed territory that the moths migrated for some distance out into nonoverflowed country and the overflowed area was surrounded by a belt from which there were many complaints of unusual bollworm damage.

Cotton Leaf Worm

The cotton leaf-worm injury in the Mississippi Valley is dependent entirely on migration of moths into that territory, and as a result there has been no apparent relation between leaf-worm damage and the overflow other than that brought about by the lateness of the crop.

The cotton aphids, which were present in the fields in enormous numbers before the overflow, were very susceptible to drowning and were greatly reduced. In consequence there has been very little "louse" activity on cotton in the overflowed area.

The cotton flea hopper was breeding on its spring host plants in large numbers before the overflow and it was expected that it would multiply upon these plants and transfer to cotton later as the earlier host plants matured. The overflow, however, drowned out all of these host plants during the breeding period of the flea hoppers, and as a result flea hoppers have been comparatively scarce until quite recently, and the damage to cotton has been negligible.

In the past, cutworms have been so closely associated with overflows that in many sections the term "overflow worm" is used as a common designation. Special observations have been made on this subject, and it has been found that in those sections where the water left the ground very quickly cutworms were exceedingly destructive to the newly planted crops. This seems to apply quite generally to those districts where the water did not stay on the ground more than two or three weeks in the early season. In districts of longer overflow there was usually no abnormal cutworm injury and in many instances it was almost completely absent, the presence or absence of damage in such cases being apparently largely a question of season. On the other hand, the heavy infestation following a brief overflow seems to be the result of the destruction of natural enemies, among which the ants are probably very important.

Fall Army Worm

The activity of the fall army worm or grass worm in overflowed areas has, generally speaking, been about opposite to that reported for the cutworms. Sections with a brief overflow had only sporadic grass-worm outbreaks, while those districts with a long overflow suffered severe damage. In the territory around Tallulah, La., most of the land that was long under water was planted at the end of July and in early August. Grass worms appeared in these fields about the time the crops came above ground. The sparse growth of weeds and grass along the ditch banks and roadsides was devoured very quickly, and then these worms began on the cultivated crops. They showed a marked preference for corn and apparently liked sorghum and sagrain almost equally well. Good fields of young corn often were devoured completely in from 24 to 48 hours. Cowpeas and soy beans were attacked, but the writer saw practically no instances of complete destruction of these crops. The damage was great enough to retard the growth considerably and thus seriously interfere with hay production, but in practically every case the plants finally recovered. Damage to cotton was severe only locally, although some worms were present in almost all fields. Usually this damage was more than would be expected from the number of worms because they have the peculiar habit of severing the branches some 5 or 6 inches back from the tip. Defoliation was comparatively rare.

A large brood of grass worms swept over this portion of the overflowed district about the end of July and in early August, but throughout the month of August there was scattered activity almost continuously. Fortunately, the September generation was almost eliminated by natural control, so those crops which had an opportunity to survive the earlier damage were able to recover.

Miscellaneous Insects

The general insect population on the cotton plants, aside from the pests of major importance, has been completely changed. Certain ground-frequenting species, such as many of the grasshoppers, were destroyed almost entirely, while other species which normally live up on the plants survived and some of these have become unusually abundant.

Undoubtedly the effect of this overflow on the insects will be felt in this territory for some years. Certain insects which multiply very rapidly recover quickly during a period in which conditions are favorable; other species, whose multiplication is not so rapid, may require years for recovery. The most pronounced aftereffect of past overflows has been the unusual boll-weevil injury which has occurred for several years following. Apparently this is due to the disastrous effect of the overflow on the ants, which constitute the greatest natural enemy of the weevil in the Mississippi Valley.

B. R. COAD.

FLOODS of 1927 in Mississippi Valley Cost Farmers Millions The great floods of the United States fall with crushing weight upon the farmer and planter, while, as a rule, his city brother at the worst escapes with little more serious damage than some water in the streets, some inconvenience for a few days, and possibly a flooding of the first floor of his house or place of business. Virtually every flood collects toll from the farmer in the shape of crop losses, both actual and prospective, the deposit of a thick layer of sand or débris on his bottom lands, the erosion of the soil, the drowning of livestock and poultry, and the destruction of buildings and movable property. He sometimes receives a partial recompense in the deposit of a fresh layer of alluvial soil, but, taken all in all, this is not entirely an unmixed benefit. It is something like a long-term promissory note, good in itself, but ready cash in hand would be of vastly greater value.

The lower Mississippi floods of 1922 and 1927 laid heavy hands upon the southern planters, just as did the Illinois and Neosho River floods of 1926 upon the northern farmers of Illinois, Kansas, and Oklahoma. It is true that the losses caused by the floods of 1927 were apportioned with greater impartiality between agricultural and other industries, but this was due to the magnitude of the flood. There was so much water that there was sufficient to cover everything, and nearly everything was covered. (Fig. 91.) Witness the almost complete flooding of the thriving cities of Greenville, Miss., and Beardstown, Ill., the desolation at Arkansas City, Ark., which was flooded to a greater or less extent on four different occasions during the 1927 flood period, and look again at the prosperous town of Melville, La., struggling first under many feet of water, and later under a deep blanket of sand. Many other well-settled communities were equally afflicted (fig. 92), but even so, it appears that at least 40 per cent of the huge flood losses of 1927 fell upon the farmer and planter.

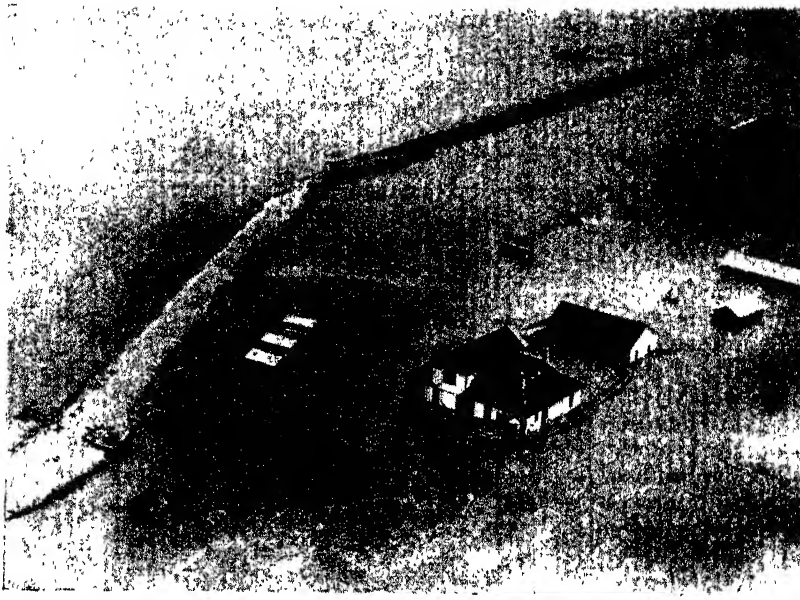

FIG. 91.—Crevasse, Mississippi River, Knowlton, Ark., April 21, 1927. (Airplane photograph)

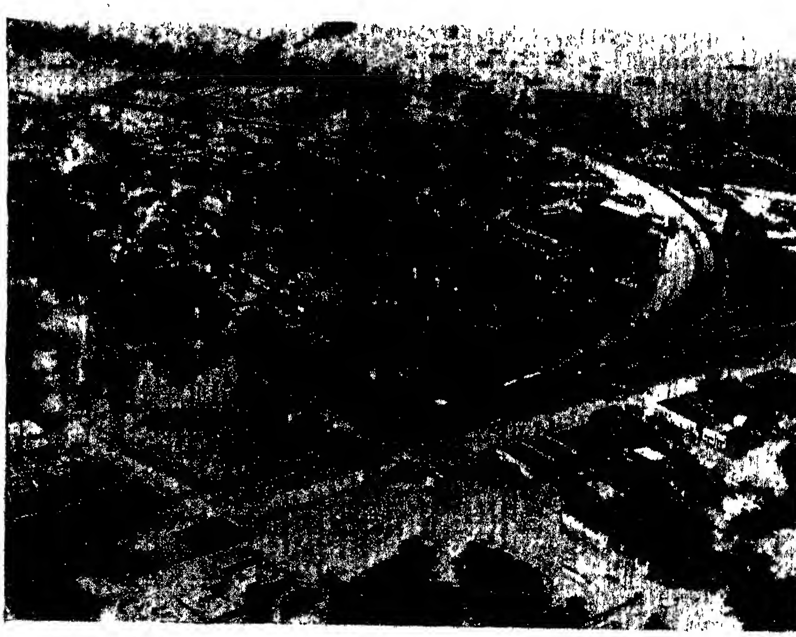

FIG. 92.—Leland, Miss., during Mississippi River flood of 1927. (Airplane photograph)

Causes of the Floods of 1927

It may be said with truth that the great Mississippi floods of 1927 began with the abnormal rains of August and September, 1926, over eastern Kansas and Oklahoma, and their rapid extension eastward over Illinois and Indiana. These rains caused the general and disastrous floods in the Neosho Valley of Kansas and Oklahoma, and the Illinois River, and somewhat lesser floods in other rivers. These floods left all of the rivers, including the middle and lower Mississippi and the Ohio, at much above their normal stages for the fall of the year. Then came torrential rains in the last two weeks of December over the Tennessee and Cumberland drainage areas, the largest tributaries of the Ohio. There were sufficient rains during January and February to sustain the rises in the rivers, although the floods were not as yet dangerous. However, the March and April rains, especially the latter between April 9 and 22, over the Arkansas, Red and lower Mississippi Valleys, were so far beyond the normal quantities that they finally caused the greatest and most disastrous flood in the history of the lower valley.

The volume of water was so enormous that, even if all of the protection levees, or dikes, had held, the waters would have completely overflowed many of them. As it was, all of the levees could not stand the strain, and no less than 225 breaks, or crevasses, occurred, releasing new rivers that flowed over the fertile lands behind. The greatest crevasses occurred on the right, or west, bank of the Mississippi River at Dorena, Mo., 37 miles below Cairo, Ill.; on the right bank at Knowlton, Ark., about 25 miles above the mouth of White River; on the left, or east, bank at Mounds Landing, Miss., almost opposite Arkansas City, Ark., at Glasscock, La., on the right bank, 22 miles below Natchez, Miss.; at McCrea, La., on the left bank of the Atchafalaya River 15 miles above Melville, La., and at Melville, on the right bank of the Atchafalaya. There were also numerous large crevasses along the Arkansas and White Rivers and along Bayou des Glaises in Louisiana.

Efforts at Replanting

Strenuous efforts were made to replant the crops as the waters subsided, many with fair success, while many other efforts failed, as another flood wave came along and reinundated the land. In some sections of southeastern Arkansas the lands were overflowed six times.

The amount of rain that fell from January to April, inclusive, 1927, over the Mississippi Basin from the Rocky to the Allegheny Mountains was sufficient to cover the entire area of 1,250,900 square miles with water to the depth of 10.79 inches, of which 7.61 inches fell during March and April.

The Ohio River first passed the flood stage of 45 feet at Cairo, Ill., on January 1, 1927, and after the end of July there were still many thousands of acres of submerged lands in southern Louisiana.

Reports received by the Weather Bureau showed that 18,268,780 acres, or 28,545 square miles, of lands were overflowed, and the estimates of the Bureau of Agricultural Economics of the Department of Agriculture indicate that of this vast area 4,417,500 acres, or about

6,900 square miles were crop lands. It also appears that about 88 per cent of the overflowed crop lands were in Arkansas, Mississippi and Louisiana.

Loss of Life and Property

Two hundred and fourteen lives were lost during the floods. The grand total of losses and damage reported was $292,117,631 of which $116,648,545 were in crops, livestock and other farm property. Livestock losses alone, were, as reported, $5,056,279 and the lost stock consisted of 25,325 horses and mules, 50,490 cattle, 148,110 swine, 1,300 sheep, and 1,276,570 head of poultry.

The above figures are necessarily incomplete for a number of reasons. Usually about 25 per cent of flood losses are not reported. Therefore if this amount were to be added to the total of $292,117,631 as given above, the grand total would be $365,147,039 of which more than $300,000,000 fell upon the three States of Arkansas, Mississippi, and Louisiana. If the usual 25 per cent were to be added to the total of $116,648,545 for crop losses, the farmer's share of the burden would be $145,810,681, or about 40 per cent of the total.

The Weather Bureau and the Floods

It is the duty of the Weather Bureau to give ample warning of the approach, intensity, and duration of floods. During the floods of 1927, warnings by telegraph, telephone, radio, airplane, newspaper, boat, courier, bulletins, etc., were given from one to four weeks in advance. Apparently these warnings fulfilled their purpose, as the consensus of a great many unsolicited comments was to the effect that the Weather Bureau flood forecasts by their timeliness and accuracy had saved thousands of lives. Moreover, according to reports from those directly affected by the floods, property to the value of $29,939,200 was saved through the flood warnings of the Weather Bureau. If the usual 25 per cent is added for savings admitted, but impossible to state in dollars and cents, the total will be $37,424,000.

H. C. Frankenfield.

FOOD and Drug Law Demands Good Quality in Nation's Anesthetics The general anesthetics, nitrous oxide, ether, and chloroform, had come into wide use in surgery by the middle of the nineteenth century. With virtually but one addition, that of ethylene some four years ago, they remain the principal general anesthetics in common use to-day, although a number of other substances have been tried from time to time with varying degrees of success. No doubt much of the trouble encountered in the early use of each of these agents may be ascribed largely to faulty technic of administration. The extent to which impurities in nitrous oxide, ether, and chloroform were responsible for the many unsatisfactory results and occasional fatalities reported in the early history of anesthesia will probably never be known.

It is not a simple matter to prepare any of these substances in a state sufficiently pure for anesthesia or to store some of them so that no deterioration will occur. During manufacture highly

poisonous by-products may be formed and during storage toxic impurities may develop. Therefore, the most careful control must be exercised over all the processes involved. In the examination of the finished product, it is not enough to run tests for the grosser impurities only. It is necessary also to detect the presence of substances which even in infinitesimal quantities may cause the patient, already under the burden of disease, additional distress.

Extreme Precision Needed in Tests

The examination of anesthetics for the presence of traces of toxic impurities often entails special and elaborate procedures. For example, in examining ethylene, methods involving fractional distillation at very low temperatures—using liquid air as a refrigerant and low pressures—are necessary to effect the separation of carbon monoxide, if present, from the bulk of the gas. The carbon monoxide-containing concentrate, aside from being examined by the usual chemical means, is subjected to tests with blood, a procedure approximating conditions in which carbon monoxide poisoning, through inhalation, is produced.

The Food, Drug, and Insecticide Administration is constantly on guard to prevent interstate traffic in anesthetics unfit for use. From time to time it conducts surveys covering the entire country, taking immediate steps to remove from the market any anesthetics found to be adulterated within the meaning of the food and drugs act. Several years ago a large number of consignments of anesthetic chloroform were seized because of contamination with chlorinated decomposition products. Recently ether found to contain aldehydes and peroxides has been seized. One manufacturer of ethylene whose product proved to be seriously contaminated with carbon monoxide has ceased the manufacture of this gas.

In the main, the surveys have shown that nitrous oxide and ethylene are of a high grade of purity. The storage of ether has given producers some concern, because of its apparent tendency to develop aldehydes and peroxides. The manufacturers have cooperated with the Government and have voluntarily withdrawn from the market all ether suspected of contamination, so that only rarely has seizure or destruction of any lot been necessary. Recent examinations of anesthetic chloroform on the market have disclosed no serious contamination or variation from the standard set by the United States Pharmacopoeia.

S. Palkin.

FOOD and Drug Law Enforcement Problems Undergo Marked Change

The Federal food and drugs act, popularly known as the "pure food law," designed to prevent the sale in the United States of adulterated or misbranded foods and drugs, became effective January 1, 1907. During the first 20 years of its existence it was enforced by the Bureau of Chemistry of this department; on July 1, 1927, its enforcement was transferred to the Food, Drug, and Insecticide Administration, a law-enforcing unit created by an act of Congress passed on January 18, 1927.

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The situation faced by the Federal food and drug official of to-day is quite different from that which confronted his predecessor in 1907. The rapid advances during the last two decades in chemistry, bacteriology, and mechanic arts have made it possible literally to revolutionize the methods used in the manufacture of foods and drugs, so that the producers of 1927 have little justification for selling impure or unwholesome articles. Also they know what constitutes a proper label and realize that they may incur the full penalty of the law by departing from the truth in describing their wares. The manufacturer of 1907, on the contrary, was free to let his imagination soar to any height in seeking to create a wide sale for his product, unless, of course, he happened to live in a State having laws to curb the use of misleading labels. Gone are the days when, for example, a mixture of cane sirup and caramel could safely be offered for sale as maple sirup. The housewife of 1927 has every reasonable assurance that a bottle labeled "maple sirup" contains the product of the maple tree, pure and unadulterated.

Industries Cooperate in Law Enforcement

American food and drug industries are now well organized and, for the most part, they seek to work with, rather than against the Government in keeping their products free from adulteration and false labeling. It is hardly reasonable to suppose, however, that the day will ever come when all adulterated and misbranded foods and drugs will vanish from the market. Some dealers will always be unscrupulous enough to try to turn a few dishonest dollars by employing new and elusive forms of adulterating foods and drugs or by using labels that violate the spirit, if not the letter, of the law, and honest dealers, through circumstances temporarily beyond their control, may now and then put out articles which fail to comply with the terms of the law. For not all machinery will function perfectly all of the time, and the raw material going into foods and drugs is bound to suffer from time to time through exposure to adverse climatic conditions, insect depredations, or plant disease. To accomplish the purposes for which it was created, then, the Food, Drug, and Insecticide Administration must exercise the police powers bestowed upon it by Congress to prevent traffic in adulterated or misbranded foods and drugs and, with the cooperation of State and city officials, as well as the industries concerned, it must devise methods for checking at their origin all abuses under the law.

The administration is so organized that it can keep in close touch with conditions from coast to coast. The administrative offices, with the necessary laboratories, are in Washington, D. C. The country outside Washington is divided into three districts, which in turn are divided into station territories. The eastern district has stations at New York, Baltimore, Boston, Buffalo, Philadelphia, Savannah, and San Juan, Porto Rico; the central district at Chicago, Cincinnati, Kansas City, Minneapolis, New Orleans, and St. Louis; and the western district at San Francisco, Denver, Los Angeles, and Seattle. Each station has a staff of inspectors and chemists.

Advance Guard of Inspectors

The inspectors are the advance guard of the force to protect the Nation against sophisticated and spurious foods and drugs. They

travel continually throughout their territories, on the alert for signs of infractions of the law. All suspicious shipments are sampled and reported on. Through their systematic factory inspections the inspectors are able to keep a very good line on the character of the output from the factories in their territories. Each year they visit as many plants engaged in the preparation of foodstuffs and drug products as time and funds will permit. If the sanitary conditions at a plant are satisfactory, if only suitable raw material is being used, if the machinery is up-to-date and well run, and if the labels are in accordance with the facts, the inspector passes along the word that no further attention to the output from this plant seems necessary. Often he is able to suggest improvements in technic which result in the packing of a product in harmony with the law, when otherwise legal action would certainly result later.

Sometimes conditions are such that the inspector feels sure that the food or drug being prepared can not possibly meet the requirements of the law. If a packer insists upon sending such a product into the channels of interstate commerce, all the stations of the administration are notified to keep a sharp watch for it. As soon as a lot of the suspected material reaches a market anywhere from Maine to California, sometimes more than one market, the inspectors in the territory or territories concerned obtain samples and have them examined at once by the chemists or bacteriologists at the nearest station of the administration. If the results of such examination show that the shipment in question violates the terms of the food and drugs act steps are taken to bring the shipper to justice or to seize his goods by court order.

Cases Decided in Trial Courts

All cases brought under the Federal food and drugs act are decided by a trial court on the evidence presented by the Government to show that a product is adulterated or misbranded under the terms of the law. Now and then a verdict is in favor of the defendant, but usually the Government's claim is sustained by the court and the goods under litigation are disposed of in accordance with its recommendation. Sometimes the defendant is fined or even imprisoned for his transgression of the law; again the goods which he has shipped in violation of the law are seized by Government officials and either destroyed or required to be relabeled or reconditioned so as to bring them into full compliance with the law. The results of all such cases are made public in notices of judgment, more than 15,000 of which have been printed since the act was passed. These notices cover cases involving a wide variety of products, all the way from a "soothing sirup" containing morphine, recommended by the manufacturer for sleepless babies, to baskets of grapes containing less than the quantity stamped on the outside.

Thus the Food, Drug, and Insecticide Administration renders the public a twofold service. Through the enforcement of the food and drugs act it safeguards the Nation's health by driving from the market foods or drugs which might prove injurious, and at the same time it protects the Nation's pocketbook by seeing to it that consumers get foods and drugs of the quality and in the quantity indicated on the labels under which they are sold.

KATHARINE A. SMITH.

FOOD Law Regulates Beverage Traffic by Label Requirements More than 11 billion bottles of nonalcoholic beverages are consumed in the United States each year. It is estimated that into these beverages go 250,000 tons of sugar, 5,000,000 pounds of fruit acid, 50,000 pounds of artificial color, 1,000,000 gallons of flavoring extract, and 400,000,000 gallons of carbonated water.

Nonalcoholic beverages—or "soft drinks," the term usually applied to them—vary widely in composition. Some, such as sparkling bottled cider and bottled grape juice, are the pure juices of fruit. Others, belonging to the "ade" class, contain 15 or 20 per cent of fruit juice. The color, sweetness, and tartness of these "ade" products are frequently enhanced by the addition of small quantities of artificial color, sugar, and citric, tartaric, or other fruit acid. So-called nonalcoholic cordials, like nonalcoholic crème de menthe, are merely thin sugar sirups with suitable flavor and color. They bear names such as Curaçao, Benedictine, Vermouth, and Kümmel. Some of them contain caffeine and are therefore not without a definite physiological action. Nonalcoholic cereal beverages, which also enjoy a wide popularity, are manufactured by making beer and reducing the alcohol content to less than 0.5 per cent by heating under reduced pressure. Sometimes caffeine is added to these beverages also.

Most nonalcoholic beverages are bottled sodas. The most common of these are ginger ale, root beer, sarsaparilla, and pop. The base of practically all sodas is the same—carbonated water and sugar sirup, acidulated with fruit acid or phosphoric acid, for convenience designated the "soda base." Individuality is obtained by combining the soda base with various ingredients designed to make the finished product pleasing to the special senses of sight, smell, and taste. When ready for consumption, therefore, bottled sodas usually contain, in addition to the soda base, minute quantities of added color and flavor.

Most Soft Drinks Harmless

Although most soft drinks now on the market are free from harmful substances, in the enforcement of the food and drugs act some are occasionally found which contain boric and salicylic acids as preservative agents, unpermitted coal-tar dyes containing arsenic or other harmful impurities, metallic salts, such as salts of zinc or of copper derived from metallic equipment or from impure raw materials, and saccharin, a sweetening agent of coal-tar origin having no food value. The use of soap bark to produce a foam or bead on beverages is of doubtful propriety because of its possible deleterious action. The use of artificial color, however, contrary to a widespread belief, is not harmful, provided only certified coal-tar dyes or harmless vegetable colors are employed.

The flavoring ingredients of soft drinks consist of aromatic substances derived from various parts of plants, including buds of flowers, such as cloves and chamomile; fruit, or parts of the fruit, such as vanilla beans and peel of the citrus fruit; seeds, such as grains of paradise and celery; roots, such as ginger and sassafras; barks, such as wild cherry and cinnamon; and stems and leaves, such as sage and peppermint. Other natural flavoring ingredients are fruit

juices, including the juices of the citrus fruits and juices from cold-packed berries. A large proportion of sodas are flavored with synthetic products, consisting of esters and higher aldehydes and alcohols prepared in the laboratory. Some of the synthetic flavoring ingredients formerly used, like nitrobenzol, are generally recognized as being harmful to health.

Carbon dioxide, the gas which causes carbonated beverages to effervesce, not only gives to such beverages a pleasant sharp taste, but exerts a distinctly harmful effect upon members of the colon typhoid group of bacteria. Time is necessary for the destructive action of the carbon dioxide, however, and even then under certain conditions all of the bacteria in the bottled soda may not be killed.

Rigid Control Exercised

Any food product that is manufactured and consumed to the extent of 11 billion bottles annually merits the careful consideration of all food officials, dietitians, and parents. The traffic in soft drinks is in fact subjected to rigid control by State and Federal food officials from a standpoint of labeling, presence of harmful or deleterious ingredients, and sanitary quality. The Federal food and drugs act requires, among other things, that the labels of beverages shall bear no statements or designs which are false or misleading in any particular, that imitations shall be labeled as such, and that the labels of bottled beverages shall bear a statement of the quantity of contents. Many State food laws are patterned after the Federal law. Therefore, if the consumer of beverages will take the few seconds necessary to glance at the reading matter on the crown cap or bottle label, he can inform himself as to the kind of beverage he is buying and govern his buying accordingly.

J. W. Sale.

FOOD Law Requires Packages to State Quantity Contained

Probably no provision of the Federal food and drugs act more intimately concerns the farmer than the "net-weight amendment," which defines an article of food in package form as misbranded if the quantity of contents be not plainly and conspicuously marked on the outside of the package in terms of weight, measure, or numerical count. Space will not permit a detailed tabulation of the various foods that may be marked according to weight or measure or numerical count. Suffice it to say that these methods can not be used indiscriminately. A plain and conspicuous declaration of the quantity of contents does not mean merely that the size of the type used shall be large enough to be readily observed. What is more important is that the terms used shall be readily understandable by the purchaser and adaptable to the product in question.

For example, the public is accustomed to buying strawberries by the quart, and, while a declaration of the number of berries in the basket might technically be correct, it might at the same time be misleading, particularly if the packer had used a short quart basket. Likewise dealers in oranges for years have been buying by the number of oranges in the crate. This practice has become standardized and

a statement in terms of weight alone will not satisfy the terms of the law because it might very well be misleading if the shipper departed from custom and adopted a short crate.

Many Warnings Sent Out

Each year it is necessary for the Food, Drug, and Insecticide Administration to send out hundreds of letters and many formal citation notices to shippers of fruits and vegetables who either fail altogether to brand their products or label them in an unsatisfactory manner. In response to these citations and letters the shippers sometimes disclaim any knowledge of the requirements of the law and again suggest that as this is but a minor infringement they should be excused. Fundamentally an ignorance of the law is not a legitimate excuse for breaking it. This maxim has been quoted from time immemorial and to an organization such as the Department of Agriculture, whose primary function is corrective rather than punitive, it might seem to be a convincing plea. But the department is faced also with the problem of enforcing the law. Whether the infraction is merely a failure to declare the quantity of contents or whether it involves the shipping of decomposed food, the food and drugs act makes no distinction as to penalties. The one is as much a violation of the law as the other.

Foods, like other commodities, must stand or fall on their own merit. No honest farmer will hesitate one moment to tell the public how much food he is putting in his packages. Every purchaser has the right to know exactly how much food he is getting for his money and to this end Congress has seen fit to provide a way for setting forth this information.

W. L. HANAWAY.

FOOD Need of Child Sometimes Exceeds That of the Adult How often a mother is heard to say, "Well, I declare, Jimmy eats more than his father. I can't imagine what he does with all that food, but I know he doesn't really need so much." And that expresses the general attitude that has prevailed toward children's food requirements until the last few years. Now scientists are beginning to recognize the fact that a child may quite justly need more food than his father does.

In scientific studies of food consumption dietary scales are commonly set up to indicate what individuals of various age and sex need in order to judge whether the food that is consumed by them meets the prevailing ideas about nutritive requirements. These scales or standards are expressed not in terms of foodstuffs, such as potatoes, beef, bread, and cabbage, but in terms of energy, measured in calories, and of protein, minerals, and vitamins. Thus, instead of standards based on 150 or more foodstuffs, they are based on about 10 nutrients.

The first scale in the United States was suggested by W. O. Atwater about 40 years ago. He stated, for instance, that a boy of 13 needed eighth-tenths as much food as a man doing moderately active work; a girl of the same age needed seven-tenths as much as a man; and a child of eight required one-half the food of a man. For all children he allowed less food than for a moderately active man.

Other scales have been suggested since Atwater's, but, like his, most of them have allowed less food for all children than they allow

for a man, and some have suggested even less for girls than Atwater did. One investigator, for instance, who allowed slightly more than Atwater did for boys of 13, thought that a standard 8 per cent below his was adequate for girls of the same age.

Early Conclusions Now Questioned

Not much study was made of children's diets before 1920. In the standards proposed before that time, however, the results of such studies as were made were included, and because they confirmed the general assumption that children should need less food than a man, and that girls should eat less food than boys, the investigators may have given them more weight than they deserved. Since 1920 a number of more or less extensive studies have been made of the food that healthy, active children eat, and these bring out the fact that at certain times they may need more food than a man. Two scales have therefore been proposed in which adolescent boys are allowed considerably more food than is thought to be necessary for a moderately active man. Another interesting point shown by these studies is that up to the age of 13 healthy, active girls eat practically the same amount of food as boys.

The fact that a normal, active child needs relatively a large food supply should be recognized by those who have charge of child feeding. The best method of handling such a problem is to assign certain foods which must be eaten, such as milk, eggs, vegetables, and fruits, or any made dishes in which these foods predominate. If a child eats his assignment of such foods without any fuss he should ordinarily be permitted to eat with his meals such energy-yielding foods as he desires. These would include bread, butter, and sweets of all kinds. But these should never be allowed to take the place of certain essential foods. If, on such a regimen, the child becomes overweight, it is probably due to an insufficient amount of exercise, and he should be encouraged to play out in the sunshine more actively.

EDITH HAWLEY.

FOOTWEAR Made Water Repellent by Various Modes of Treatment

On many occasions waterproof, or, rather, water-repellent shoes and boots are desirable, not only for the comfort of the wearer and the protection of his health, but also for the protection of his footwear.

Leather shoes and boots may be easily damaged, even ruined, if worn when wet. Wet leather is soft and readily stretches out of shape. Stitches cut through it, and it wears away rapidly.

Wet shoes and boots dried carelessly and too fast shrink and become stiff. Wet leather is injured more easily by overheating than dry leather. If it becomes hotter than the hand can bear, it is almost sure to be ruined. Many persons unwittingly spoil their shoes and boots by placing them when wet against hot stoves, hot radiators, hot steam pipes, or even in hot ovens. (Fig. 93.)

Wash the mud and dirt off wet shoes or boots. If for work or rough use, it is then best to oil or grease them with one of the preparations mentioned later. Straighten the uppers and stuff the shoes or boots with crumpled paper to help keep their shape and to hasten drying. Finally, let them dry slowly in a place that is not too warm.

The rational use of suitable oils or greases will make shoes wear longer. Shoes worn on farms, in forests, and in mines are improved by oil or grease whenever the leather begins to harden or dry. Among the best materials for this purpose are neat's-foot, cod, and castor oils, tallow and wool grease, or mixtures of these materials.

FIG 93 —Middle sole "burnt" when wet The burnt leather is brittle and crumbly and falls out in pieces

To apply, first brush off all dust and dirt and then warm the shoes or boots carefully, keeping in mind the danger of burning them if they are wet. Apply the warm, but not hot, oil or grease with a wad of wool or flannel and rub it well into the leather, preferably with the palm of the hand. Be sure to work the grease in well where the sole and upper join, as water soaks through there most often. Let the oiled or greased shoes dry in a warm, but not hot, place.

How to Make Shoes Waterproof

Treating shoes and boots as just mentioned will help them to turn water, but will not make them waterproof, even in the usual sense of the word. For waterproofing, the following simple formulas and procedure have been found satisfactory:

Formula 1

Neutral wool grease ----- ounces --	8
Dark petrolatum --------- do ----	4
Paraffin wax ------------- do ----	4

Formula 2

Petrolatum ------------- ounces --	16
Beeswax ---------------- do ----	2

Formula 3

Petrolatum ------------- ounces --	8
Paraffin wax ------------- do ----	4
Wool grease ------------- do ----	4
Crude turpentine gum (gum thus) --------------- ounces --	

Formula 4

Tallow ----------------- ounces --	12
Cod oil ----------------- do ----	4

Melt together the ingredients and mix thoroughly. Apply the warm but not hot mixture to all outside parts of the shoes or boots. If they are for summer wear, apply only as much as the leather will take up without leaving a greasy surface. If for winter wear, an excess will do no harm. Grease thoroughly the welt and the edge of the sole. Saturate the sole with the water-proofing mixture. This can be done conveniently by setting the shoes in a shallow pan in which is enough of the melted mixture to cover the entire sole. Rubber heels should not be put in the grease, as it softens them. To waterproof the soles of shoes with rubber heels, use a pie pan and set the shoes astraddle the rim of the pan with the heels outside. (Fig. 94.)

FIG. 94 —Waterproofing the sole of a rubber-heeled shoe

Less Protective than Rubber

One should not expect to be able to waterproof leather footwear so that it will be the equal of rubber boots or overshoes for prolonged wear in water or slushy snow; yet substantial, properly made leather shoes and boots can be waterproofed with the preparations mentioned to protect the feet satisfactorily during stormy weather or for use on wet ground or pavements where there are no deep puddles. Waterproofed shoes and boots keep in the perspiration to a large extent. They are, however, less objectionable than rubber footwear in this respect.

Any oil or grease will darken, to some extent, the color of fair or light leathers. Furthermore, oily or greasy leather can not be polished satisfactorily.

To make street or every-day shoes fairly water resistant and yet capable of being polished, the oil or grease mixture may be carefully applied to the soles only, as with a brush, taking pains to get none of the mixture on the uppers. If lightly oiled with castor oil and left for from 12 to 24 hours, the uppers may be polished. The castor oil can be conveniently applied by means of a small wad of oiled cheesecloth, but care must be taken not to put on too much.

R. W. Frey and
H. P. Holman.

FOREST Administration Policy Permits Wide Range of Private Use The somewhat generally prevalent impression that national-forest lands are rather completely withdrawn from the customary forms of private use and occupancy is incorrect. The guiding principle of national-forest administration is the one laid down by former Secretary of Agriculture James Wilson, which was: "All the resources of national forests are for use, and this use must be brought about in a thoroughly prompt and businesslike manner, under such restrictions only as will insure the permanence of these resources." Under this principle all forms of land occupancy compatible with the purposes for which the national forests were established are allowed under permit.

Special uses of national-forest land that are of a public character or of general public benefit, and those related to some major use of national-forest products, such as logging, grazing, etc., usually are granted without charge. For privileges of an exclusive nature, or for the use, benefit, or profit of an individual or company, a reasonable annual fee is required. On June 30, 1927, 33,065 separate special uses of national-forest land were in effect, of which 14,882 were without charge and 18,237 subject to the payment of reasonable annual fees. For the fiscal year 1927 the payments for special uses of national-forest land amounted to $277,611.53.

Permit Issuing a Simple Process

The process of obtaining a permit is a simple one, and 95 per cent of the business is handled directly on the ground by the field officers of the Forest Service. Upon advice received by a forest officer, by letter or verbally, that a certain special use is desired, an examination is made to determine whether it will be the best use of the area and

not in conflict with public or other private interests. If so, the area is surveyed, marked, and mapped, a permit is prepared, and if the permit is not a free one the applicant is directed to remit the initial payment to the district fiscal agent. That having been done, the only further requirement, other than the observance of the terms of the permit, is to remit the annual rental when notified to do so.

Western livestock growers are the most numerous occupants of the national forests, with 5,577 pastures, 2,808 drift fences, 1,659 corrals, 798 stock-watering tanks, 44 dipping vats, 6 slaughterhouses, and 1 shearing plant, a total of 10,893 uses related to grazing alone. The stock growers also occupy a considerable proportion of the 971 cabins maintained under permit.

Recreationists constitute the next largest group of special-use permittees, with a total of 9,405 cases. Summer residences number 8,735, resorts and clubhouses 613, and hotels and roadhouses 52. There are three golf courses and tennis courts, and two playgrounds.

Fur Farms in National Forests

Fishing, hunting, and trapping on the national forests are governed by State law and require no permit from the Forest Service, but the various uses related to these activities number 1,346, to which may be added the 251 fur farms maintained under permit on national-forest land. The majority of the fur farms are in Alaska, where the small islands off the coast offer many advantages to the fox farmer; but the economic possibilities of raising muskrats, beaver, etc., under control in the Western States are leading to numerous requests for fur-farm permits. Fish hatcheries on national-forest land now number 87. The 59 fish canneries and salteries operated under permit in Alaska, while not sporting propositions, may properly be included in this group.

Most of the agricultural land within the national forests has been listed for entry under the forest homestead act, but some of the areas necessarily retained for other more important public uses have temporary values for crop production which are realized through the issuance of 1,405 permits. An allied branch of agriculture, the bee industry, is represented by 55 apiaries, while 12 persons have permits to operate old orchards on lands acquired by purchase under the Weeks law, and one operates a tree nursery.

National-forest lands are freely available for schools, of which there are 207; churches, which number 18; and cemeteries, of which there are 39. Stores, shops, and offices total 194. Other widely diversified forms of use, some of unique character, occur in small numbers, as for example, monuments, of which three are maintained on forest land under permit, and observatories, of which there are five.

Diversion of Water

The impounding and diversion of water necessitates the issuance of many permits. To begin with, 38 watersheds are under permit to the communities dependent upon them for municipal supplies. Permits for wells, springs, and windmills number 823, while the number of reservoirs is 1,109, and the number of ditches, conduits, pipe lines, etc., reaches the large total of 2,575. Water-power development must be

under license from the Federal Power Commission; consequently the 387 power projects within the national forests are not included in the special use returns.

There are 93 permits for common-carrier railroads, 6 for electric roads, and 78 for logging railroads, together with 29 for railroad-station grounds. Privately constructed roads, bridges, trails, and driveways to the number of 245 are authorized, of which three are toll roads to points of outstanding service interest for which public agencies were unprepared to supply highway facilities. Telephone lines are now indispensable to rural life and 785 are occupying forest lands, while 884 permits allow connection with and use of telephone lines constructed by the Forest Service.

The operation of many sawmills is authorized by the contracts under which national-forest timber is purchased, but there are in addition 531 sawmills operating under special-use permit, together with 28 log flumes, chutes, and skidways, and 13 lumber yards.

If a man wants to cut wild hay or operate a service station, or harvest the honey content of the flowering plants, or retire to a home remote from the hustle and bustle of modern life, or needs a site for some new enterprise, the chances are that the Department of Agriculture can meet his needs within the national forests in a thoroughly satisfactory way.

L. F. Kneipp.

FRUIT and Vegetable Marketing Facilitated by Clearing Houses

Orderly and efficient distribution of fresh fruits and vegetables is one of the most difficult problems connected with the marketing of those commodities. A steady supply in consuming markets sufficient in volume to meet demand is essential to successful marketing. An oversupplied or glutted market frequently results in carload sales that bring freight charges only, or even less. Disorderly or haphazard distribution also results in undersupplied markets which are unable to secure adequate supplies regardless of demand.

With our recent rapidly increasing commercial production it has become necessary each year to widen the field of direct distribution and to supply more of the smaller cities direct from shipping point. Increased shipments and wider distribution have made the regular and adequate supplying of a large number of markets increasingly difficult.

The market news service on fruits and vegetables, inaugurated in 1915, made available to growers, shippers, and dealers of fresh fruits and vegetables a fund of valuable information on carload movements and market prices. For the first time dependable car-lot shipment information, including primary destinations and diversions, could be secured from a disinterested and authentic source. Awake to the realization of the need for a more orderly distribution, the cantaloupe industry in the Imperial Valley of California took advantage of this opportunity for securing authentic car-lot shipment information and the same season, in cooperation with the United States Department of Agriculture, inaugurated the first clearing-house work. From a rather experimental beginning the work developed into an efficient plan of furnishing information to shippers which has made possible the orderly distribution of from 12,000 to 15,000 cars yearly from the Imperial Valley during a period of about seven weeks.

The Plan of Operation

The plan of operation of this first clearing house for car-lot shipment, diversion, and destination information on cantaloupes was as follows: The Brawley, Calif., office of the Department of Agriculture's market news service on fruits and vegetables secured each day from the officials of the railroads serving this producing area a record of all shipments of cantaloupes with primary destinations and reports showing diversions made at the main diversion points. From department representatives in the large markets were received daily telegraphic reports showing the number of cars of cantaloupes received and remaining on track each day. This information was consolidated and tabulated to show the daily flow to market and the volume of current and potential supplies for the markets for which these data were gathered. In addition, all shippers who had loaded cars ready to move, or who had billed cars since the previous day, reported to the department's Brawley office the number of cars moved or ready to move with the billed or contemplated destinations. At a daily meeting, usually at 1.30 p. m., this information was read to the shippers present, thus enabling them to gauge the potential supplies to be expected in any market. The basis used for estimating the daily or weekly quantity needed to supply any particular market was the estimated quantity such a city could or should consume as shown by past experience. For example, a large city or market migh' readily consume 10 cars daily, whereas smaller markets might only be able to handle 1 car a day or 3 per week. If the daily figures showed that more cars were destined to any market on any particular day than that market could handle without being oversupplied, some shipper billing or intending to bill one or more cars to such a market could divert or change his billing to some other point that was in danger of being undersupplied. At no time was any attempt made to control the volume of shipments or restrict the output.

For seven or eight years this plan of operation worked especially well with Imperial Valley cantaloupes for three principal reasons: (1) Because no serious competition from other producing areas had to be met, as the valley season is very early; (2) because practically all shipments were consigned; and (3) because the shippers cooperated fully in making the distribution successful. During the past few years clearing-house work in the Imperial Valley has been partially discontinued because of a great increase in f. o. b. selling and the resultant impracticability of diverting cars from one market to another.

Clearing House for Prunes

The next clearing house undertaken was on Northwestern prunes in 1926, in the Milton-Freewater-Walla Walla district in Washington and Oregon, with headquarters at Walla Walla, and in the Boise-Payette district in Idaho, with headquarters at Boise. Approximately the same plan as the Brawley plan was followed except that the growers were organized into a cooperative association, with approximately 100 per cent organization, and shipments made either through the association or through some shipper or shipping agency acceptable to the association. The prunes clearing-house work was very successful in 1926 and was continued in 1927 with even greater success.

The largest-scale clearing-house work attempted so far was undertaken in 1927 in regard to California grapes. This movement normally fills between 65,000 and 75,000 cars annually. An organization called the California Grape Clearing House was formed (with a membership controlling tonnage that approximated 60,000 to 65,000 cars) to collect, tabulate, and distribute information on grape shipments, destinations, diversions, passings, market receipts, cars held on tracks in markets, and cars unloaded to its members for their guidance in distributing and marketing their crops. The cooperation of the Bureau of Agricultural Economics through its office at San Francisco followed the same general lines as at Brawley, Walla Walla, and Boise, except that special daily unload reports in 29 of the largest markets in the United States were secured and the car-lot information was segregated into table stock, white-juice, and black-juice stock.

The California Grape Clearing House work should be considered as experimental this first year. It apparently met with a fair degree of success and appears assured of continuance another year. Indications are that complete success of the grape clearing-house plan would be followed by similar projects in other producing areas with regard to other fruits and vegetables, especially where competition is not too harsh and where other conditions are favorable.

B. C. Boree.

FRUIT Flavors Due Principally to Free and Volatile Acids A knowledge of the acids of fruits is important for the physician, the dietician, and the chemist who deals with the analysis of fruits and fruit products. Some organic acids are readily oxidized in the body, the sodium, potassium, or calcium with which they are combined remaining behind as bases which counteract the acids of metabolism and help to keep the fluids of the body neutral. Unfortunately all organic acids are not beneficial to the body. Benzoic acid and oxalic acid, present in small quantities in a few fruits, are not oxidized and may cause a toxic condition if taken in large quantities.

Acids largely determine the flavor of fruits. The volatile acids enter into the composition of the characteristic flavor in the form of esters, whereas the free nonvolatile acids produce the acid taste. In most fruits the nonvolatile acids consist of citric or malic acid or a mixture of the two. Free acids, together with pectin, which is present in certain fruits, are essential in the preparation of jelly. Jelly can not be made from fruit deficient in either acid or pectin unless the missing substance is added.

Tartaric acid is comparatively rare; it is found in the grape and the tamarind. Rhubarb contains a small quantity of oxalic acid; malic acid predominates in this vegetable. Isocitric acid, a rare acid closely related to citric acid, has recently been found to be the predominating acid of the blackberry, but as yet it has been identified in no other fruit. Succinic, benzoic, and lactic acids have been found in some fruits but in very small quantities. Citric acid constitutes 90 per cent or more of the nonvolatile acids of the lemon, orange, pomegranate, raspberry, strawberry, Loganberry, currant, and blueberry, whereas malic acid predominates in the apple, cherry, and quince.

Experiments on Various Fruits

Experiments conducted in the Bureau of Chemistry showed that the nonvolatile acid of Bartlett pears consists of about 2 parts citric acid and 1 part malic acid. Cranberries obtained on the Washington market had a total nonvolatile acidity equivalent to four-fifths citric acid and one-fifth malic acid, in addition to benzoic acid to the extent of 0.07 per cent of the fruit. Concord grapes contained about three-fifths malic acid and two-fifths tartaric acid, peaches contained malic and citric acids in nearly equal quantities, and the apricot contained about three-fifths malic acid and two-fifths citric acid.

The nonvolatile acidity of fruits is seldom either citric or malic acid alone. In the California lemon citric acid contributes at least 99 per cent of the acidity, but a trace of malic acid was found. In a sample of Winesap apples, the acidity of which is mainly due to malic acid, a small quantity of citric acid was identified.

The total acidity of most fruits differs with the variety under consideration and with the degree of ripeness. Also the relative proportion of the several nonvolatile acids may vary, not only with different fruits, but even with different varieties of the same fruit. Appreciable differences may sometimes exist in the relative quantities of the organic acids in fruits as a result of variations in degree of ripeness, climate, and other factors.

E. K. Nelson.

FRUIT Improvement Work Advanced at Experiment Stations

When the Europeans first came to America they brought with them seeds and cuttings of their favorite fruits, but in most instances were bitterly disappointed in the behavior of the new introductions. The hot summers and the severe winters proved generally unfavorable to the Old World fruits, especially apples, grapes, raspberries, gooseberries, and strawberries. The need of combining the high quality of the European with the hardiness and the vigor of the native American species was early recognized, and many private individuals engaged in fruit breeding, sometimes with good results but more often meeting disappointment, largely because of limitations in money, time, and equipment. Many years are required to bring a seedling fruit to maturity, and the life and the resources of the individual were usually altogether too short. Despite many obstacles, these pioneers produced many notable contributions—for example, the Concord grape, originated by Ephraim Bull of Concord, Mass., and the Wealthy apple, originated by Peter Gideon of Excelsior, Minn. The need of public support was early apparent, many of the pioneer fruit breeders dying in poverty despite their great service, so that it was only natural that upon the organization of the agricultural experiment stations fruit improvement in its various phases—spraying, pruning, fertilizing, and breeding—should have become at once one of the important functions of stations located in the fruit-growing States.

The extended periods of drought and the occasional severe winters made the hardiness problem of paramount importance in the Great Plains States. Pioneer breeders of the type of Peter Gideon of Excelsior, Minn., originator of the Wealthy apple, and C. G. Patten of Charles City, Iowa, originator of the Patten Greening, opened the

way, so it is quite natural that we find the stations in this area early engaged in fruit improvement. South Dakota, Minnesota, and Iowa have taken the lead in this work.

Improvement by Breeding

The South Dakota station has made a critical study of the native fruits of the State, selecting and propagating the best forms and further improving them by hybridization with less hardy eastern varieties and even reaching out to the cold regions of the Old World for hardy and better quality parental forms. In response to the urgent demand of the settlers, who came largely from the fruit-growing States of the East, the Minnesota station from its beginning has been very active in fruit breeding and now has at Zumbra Heights, near St. Paul, one of the best equipped fruit-breeding plants in the world. Apples, plums, grapes, raspberries, and strawberries have received particular attention. Many valuable seedlings have resulted, the Latham red raspberry now grown throughout the fruit-producing region of northeastern United States being an outstanding contribution. By successfully crossing the native pin cherry with a cultivated form the Minnesota breeders have opened the way for a new race of hardy cherries. The Iowa station has several very promising apples to its credit and is also carrying on the work of the late C. G. Patten at Charles City, who left as a heritage hundreds of promising apples and pears. Farther east the Illinois station is carrying on extensive apple and peach breeding operations involving literally thousands of seedlings, some of which will undoubtedly be better adapted than present varieties to the prairie conditions. Farther south the Missouri station is working on the breeding of apples and peaches which will blossom late enough to avoid the late spring freezes. The Michigan station has the honor of introducing the valuable South Haven peach to growers throughout the country.

The far-western stations have been actively concerned in urgent spraying, cultural, and marketing problems to the neglect of fruit breeding; yet at the Idaho station there is to be found a large collection of seedling apples in the process of elimination tests. The Oregon station at the southern branch at Talent is making a substantial contribution to the improvement of the pear by testing species from all over the world for use as blight-resistant stocks. Studies at the Oregon station of the sterility relationships within and between varieties of sweet cherries, filberts, plums, and other fruits have greatly helped growers to select profitable varieties for planting. The California station has also made a substantial contribution to the pollination problem in pears, plums, cherries, and almonds, and has made some progress in the development of new almonds with a late-blooming habit helpful in avoiding late frosts.

Among eastern stations the New York State station at Geneva has taken the lead in the improvement of fruits, notable contributions having been made in various species, apple, pear, grape, peach, raspberry, and strawberry. The Cortland apple, the Sheridan grape, the June raspberry, and the Prolific strawberry are among the station seedlings which have already gained commercial recognition. In addition, the New York station has assisted materially in fruit improvement by testing thousands of Old and New World varieties for their adaptation to the northern fruit belt, a work which has

resulted in the introduction of several meritorious fruits and incidentally in the preparation of a series of elaborately illustrated monographs which have proved of material assistance to systematic pomologists everywhere.

The New Jersey stations, concentrating on peach improvement, have developed some splendid new varieties and have shown why the otherwise highly desirable J. H. Hale variety fails to bear fruit when planted by itself. The Maryland station, in crossing varieties of early ripening apples to study the inheritance of early maturity, has produced some very promising seedlings.

As a rule, the southern stations have not taken the general interest in fruit improvement that has been shown in the northern fruit States, a natural expectation for regions where cotton, corn, and truck crops are more important. The Texas station, working with native dewberries, developed a promising variety known as the Ness berry.

Other Means of Improvement

Although emphasis has been placed in this paper on breeding studies, the stations have by no means been inactive in other lines of fruit improvement. Investigations on the control of insect and disease pests have been participated in by practically all the stations in the fruit-growing States Soil-management and soil-fertility studies conducted in many places have resulted in the development of rational programs greatly in favor of the production of first-class fruit. To the stations must also go the credit of developing the fact that nitrogen is generally the limiting nutrient in fruit growing. Pollination problems mentioned in connection with the Oregon and California stations have received wide attention, Maine, Maryland, New Jersey, New York, Michigan, Wisconsin, West Virginia, Ohio, Oregon, and California all taking a conspicuous part. Pruning studies in their fundamental aspects, such as the relation of pruning to fruit-bud formation, have also contributed materially to fruit improvement, which, broadly construed, may be taken to include practically all studies relating to fruits.

Greater Results Expected

Taking into consideration the comparatively short life history of the experiment stations and the very long time required in the development and testing of a new fruit variety, progress in fruit improvement by breeding has been very satisfactory. The future can but hold much greater rewards, for with improved methods and with a background of knowledge already accumulated progress should be much more rapid. It must be borne in mind that thousands and literally tens of thousands of seedlings may be produced without obtaining a single outstanding new kind. This long chance for success is being slowly reduced as the principles governing inheritance are better understood; yet the great expense of breeding experiments, as measured in time and material equipment, precludes any tremendous expansion of the work in the future. The greatest hope lies in better trained men working with improved technique and the foresight gained from the experience of the present and the past.

J. W. Wellington.

FRUITS and Vegetables Distributed by Auto Truck to Small Towns The enormous increase in market supplies of many fruits and vegetables during the last decade, as evidenced by the greater volume of carload and truck shipments, in many instances has resulted in unsatisfactory prices to the producers. The problem of increasing the demand by obtaining a wider and more thorough distribution among the consuming population has received much attention by shippers and dealers.

Thirty-six of our principal cities, with a population of 22 per cent of the total for the United States, in 1926 unloaded 58 per cent of the United States carload shipments of 16 leading fruits and vegetables. Unload reports from 79 important cities in 1926, including the 36 previously mentioned, indicate that about two-thirds of the carload shipments of the 16 important fruits and vegetables were unloaded in these cities which had a combined population of 26 per cent of the population of the United States. This does not mean that the remaining 74 per cent of the population used only one-third of the carload shipments. The population in the areas contiguous to the large markets naturally draw their supplies from these sources by less-than-carload rail shipments or by truck.

The shipper is concerned as to whether his product is being offered for sale in the smaller cities, towns and rural districts. This possibility of widening his market is especially inviting at times when the product is not competing directly with local production of the same fruit or vegetable in the consuming territory. For example, southern peaches or western cantaloupes, arriving before the ripening of the local product, would be expected to find customers in the small cities and rural districts in the North, whereas later in the season the local production often supplies the demand.

As a matter of fact, a considerable part of the unloads of our large cities are distributed to the smaller cities and towns within a radius of 75 to 100 miles. Automobile trucks have come into wide use for this purpose although large quantities are shipped out by rail, often in mixed carloads.

Estimates from dealers in 17 southern cities indicate that during the 1926 season from 25 to 75 per cent of the carload receipts of box apples were distributed to the surrounding territory by truck or in less-than-carload shipments. The average was from 40 to 45 per cent. For certain northern markets the percentages ranged from 5 to 40 per cent A canvass of a number of cities in eastern Pennsylvania (populations 20,000 to 50,000) indicated that from 10 to more than 50 per cent of the southern peaches used in 1926 in these cities and adjacent territory were brought in by truck or in less-than-carload-lot shipments from Philadelphia, or Baltimore. For the smaller cities and towns especially those within a radius of 75 miles of the large markets, the greater part of the southern peaches consumed was brought in by truck or by less-than-carload-lot rail shipments.

Distribution in Small Towns

If the eastern Pennsylvania area may be considered typical, southern peaches were on sale in most of the small towns and villages in the north during the heavy shipping season in 1926. Dealers in

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the smaller cities frequently have their own trucks and make regular trips to the near-by towns and rural districts to supply the local storekeepers with fruits and vegetables or to sell direct to consumers. Peddlers and hucksters also engage in this work. In this way a rather thorough distribution of fruits and vegetables is effected. It is debatable as to how much the consumption of shipped-in fruits and vegetables can be further increased in the smaller cities and rural districts. Reasonable prices and good quality are essential factors in increasing consumption in these localities as well as in the larger cities.

The argument has often been advanced that the cost of distribution can be decreased and consequently the consumption increased by shipping direct to the small cities in carloads. Many dealers in the smaller cities now have modern cold storage plants in connection with their warehouses, with capacity for storing several carloads. These plants tend to prevent spoilage and extend the period of availability of perishable products to the consumer.

In considering this possibility, two general classes of fruits and vegetables should be kept in mind; (1) those which are less perishable and on which price fluctuations are usually less violent, such as potatoes and apples; (2) the more perishable ones such as peaches or tomatoes which are frequently subject to sharp price fluctuations. The first class can be distributed to dealers in the small cities in areas of deficient production in carloads direct more satisfactorily than can the second class.

Time Required for Car-Lot Disposition

Even where good storage facilities are available for the more perishable products, it usually requires several days for a dealer in a small market to dispose of a carload. In the meantime the price sometimes drops sharply in the city markets as the season advances. Competitors quickly take advantage of the situation to bring in supplies by truck or in less-than-carload shipments from the large markets, thus forcing down the price with financial loss to the dealer who may have purchased the carload at higher prices. In the case of southern peach shipments to the smaller Pennsylvania cities, the saving in transportation charges on carload shipments received direct from the producing area often amounted to 20 to 30 cents per crate or per bushel over transportation on peaches received through the larger markets by truck or in less-than-carload shipments. Many dealers, however, considered this advantage was outweighed by the greater risk of financial loss on cars purchased and billed direct to the small city destination from the producing area. Many dealers in the small cities send their own or hired trucks to the large markets daily and thus have a choice of a large amount of the fruits and vegetables they desire and state that by doing so they can always have fresh produce for sale and can be assured of better value in their purchases.

Local production of fruits and vegetables will greatly affect the demand for shipped-in products. Even a prospective heavy crop, such as peaches in a local district in the north, may greatly curtail the demand for southern peaches because consumers believe they will later be able to obtain this fruit locally and probably at a low price.

Good roads have encouraged hucksters and peddlers to distribute shipped-in produce to the small towns and country districts as well as in bringing locally-grown produce to the cities. (Fig. 95.)

In general the machinery for distributing shipped-in fruits and vegetables to the small cities and rural population is fairly efficient, but it is being further developed by means of truck movement and

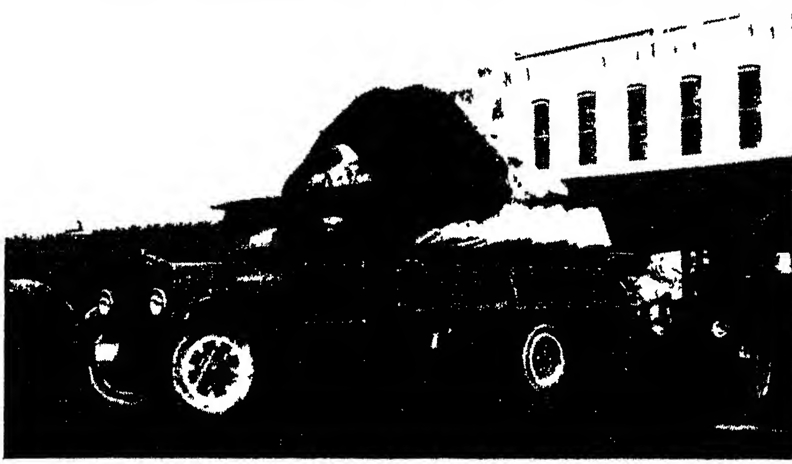

FIG 95.—Auto truck loaded with vegetables for distribution to small markets

the addition of local storage facilities in the small cities. Progress in distributing fruits and vegetables is encouraged by the facts of improved quality, lessened waste, availability throughout a longer season, and lowered distribution costs.

J. W. PARK.

FRUITS and Vegetables for New York Drawn from Varied Sources The metropolitan district of New York contains a population of more than 10 million, almost one-tenth of the inhabitants of the entire United States. This means that one-tenth of the food requirements of the entire Nation must be met in this restricted and congested district.

In 1926 receipts of 69 perishable fruits and vegetables totaled more than 211,000 carloads. This would be equivalent to a solid train of freight cars 2,100 miles in length. It is estimated that the average length of haul for New York's fruits and vegetables is 1,500 miles. When we take into consideration that New York City required an average of 580 cars for each 24 hours, and usually at any one time has only 48 hours' supply on hand, we realize the need for constant movement of these products to this city.

The largest single source of car-lot shipments of fruits and vegetables for the metropolitan area is California with New York and Florida the closest competitors. Of 16 important products, California contributed more than 36,000 car lots of which 17,445 cars were grapes, 6,976 oranges, 4,315 cantaloupes, 3,917 lettuce, and 1,528 lemons. New York supplied more than 18,000 car lots, of which 6,336 cars were apples, 4,024 cars potatoes, 1,921 cars lettuce, 1,454 cars cabbage, and 1,377 cars celery. Florida furnished more than 13,000 carloads, of which 4,789 cars were oranges, 2,276 cars grapefruit, 1,432 cars

potatoes, 1,382 cars tomatoes, and 1,145 cars celery. Maine furnished the most potatoes, 8,654 cars of 20,978 cars unloaded. Georgia furnished 4,021 cars of the 6,032 cars of peaches unloaded and 1,406 cars of the 3,835 cars of watermelons taken. Virginia supplied 1,152 cars of the 2,113 cars of sweet potatoes.

Among the more than 45,000 car lots of imported fruits and vegetables unloaded there were approximately 33,570 cars of bananas, 1,939 cars of lemons, 3,160 cars of onions, 2,427 cars of grapefruit, 844 cars of oranges. It is estimated that 23,900 cars of these bananas were not handled by the New York auctions, and it is safe to assume that all the onions, lemons, oranges, etc., were not used in New York City.

Of the 14,200 cars of garnishes, salads and greens, lettuce led with 8,341 cars, spinach 4,046 cars, kale 610 cars, escarole 477 cars, and of the more unusual ones, anise 31 cars, chicory 179 cars, collards 56 cars and endive 14 cars.

New York uses many of the less common fruits and vegetables among which were 71 cars of pomegranates from California, 1 car loquats from Florida, 50 cars avocados from California, Florida and Cuba, 8 cars Brussels sprouts from Long Island and California, 132 cars mushrooms from Pennsylvania, New Jersey, and Ohio, 88 cars of okra from Cuba, Florida, Louisiana, North Carolina, and Tennessee, 23 cars leeks from Louisiana and Florida, 149 cars of garlic from California, Texas, and Chile, and 32 cars horseradish from Missouri.

Out-of-Season Fruits Welcomed

The people of New York apparently welcome unseasonable fruits such as fresh peaches from Argentine during March, grapes from

FIG. 96 —Lighters bringing cars of produce across the Hudson River from the yards in Jersey City to the New York piers

Argentine and Chile during February, March, April, and May, and cantaloupes from Argentina and Chile during February, March, and April. Although the quantities received were small, they were taken freely.

Of the 2,500 car lots of berries used during 1926, 1,625 cars were strawberries, 492 cars mixed berries, 186 blackberries and dewberries, 171 cranberries, 39 huckleberries, and 11 cars of raspberries.

It is true that only a minor portion of the perishables are now shipped to New York by boat but it is also true that the bulk of the deliveries must be brought across the Hudson River on lighters. (Fig. 96.)

In addition to the car-lot figures given, the equivalent of 3,414 cars of 13 fruits and vegetables were received in less than car lots by freight and express, and large quantities of both fruits and vegetables for which no reliable estimates are available were delivered by trucks from near-by producing areas.

LUCY WATT.

FUNGICIDE as Term Commonly Used Has Three Definitions The extensive use of fungicides in the treatment of plant diseases followed the discovery of Bordeaux mixture in France in 1883 to 1885, but certain other materials, sulphur especially, had been used to kill fungi for many years previous to that time. In the first report of the newly established mycological section in the annual report of the United States Department of Agriculture for 1886 the term "fungicide" was used. This was a new word which had only recently been coined. A corresponding term, "insecticide," was in frequent use at that time and had been for many years, and the term "germicide" was also in general use. But germicides are used to kill germs of any sort, whether they are microbes of an animal or of a vegetable nature.

The term "disinfectant" was also in wide use previous to this time, but it covers a still broader field, which includes the killing or destruction of infectious material of all kinds whether of animal or vegetable nature, microscopic or larger size. The term "fungicide" was more restricted and special. It was devised to designate specifically certain chemical substances which would kill fungi when sprayed upon or otherwise applied to living plants in their most active tender growing stages. The term came rapidly into use, as it was evidently a necessary one, but its rather restricted use was gradually broadened and its scope made wider than originally intended. This may have been due to the construction of the word, literally meaning fungus killer, which apparently defines itself. The result is that we can now lay down at least three distinct definitions of this term in common use.

(1) There is the restricted definition of the term "fungicide," i. e., any substance which may be applied to higher living plants in active growth and which will kill parasitic fungi or prevent the development of fungous diseases without killing or seriously injuring the host plant. This was the original definition, drawn up to distinguish between germicides or disinfectants, which, though they might kill fungi, would injure or kill the host plant, and special chemicals or mixtures which could be applied to plants at a proper dosage and would kill or prevent the growth of fungi without injuring the plant even though in active growth. Some of the most harmless fungicides are so noninjurious to the host plant as not to require any special restriction as to dosage, but the idea is not to exclude substances which may require rather keen discrimination as to strength of materials or quantities

applied. The definition is broad enough to include any method of application, spraying, dusting, dipping, or gassing.

The useful term "fungicide" soon began to be used to include materials applied in seed treatment or to dormant plants, especially dormant hardwood plants; and the original restricted definition became partly obscured. The result of this broader use was the following more general definition.

Second General Definition

(2) The general definition of the term "fungicide" may be stated as follows: Any substance which kills parasitic fungi or prevents and retards their germination and development and which may be applied to higher living plants or animals, whether active or dormant, or to the soil in which they are living, and which will not kill or seriously injure the hosts.

This definition includes only substances, and, of course, includes the idea of correct dilutions or proper dosages, and applies particularly to so-called chemical substances or compounds used for this purpose. The killing or retarding effects on fungi of heat and cold, sunlight, or other rays, electricity, and even aridity, are sometimes discussed as to their fungicidal effects.

Even this general use of the term has been extended in certain cases to the killing of fungi, regardless of the killing effect on higher living plants and animals, thus covering the destruction of fungi in wood, dead or decaying matter of any kind, and even of buildings, warehouses, containers, canned and preserved products, the soil, and waste materials, resulting in a still broader definition.

(3) There is the broad definition of the term "fungicide." In the insecticide act of 1910 and the accompanying regulations it became necessary to define the terms "fungi" and "fungicide" as used in that act. "Fungi" was defined as follows:

> The term "fungi," as used in the act and these regulations, is understood to mean all nonchlorophyll-bearing plants of a lower order than mosses and liverworts (i. e., nonchlorophyll-bearing thallophytes), comprising rusts, smuts, mildews, molds, yeasts, bacteria, etc.

The broad use of the term "fungicide" was finally crystallized into the definition essentially as follows: Any substance or mixture of substances intended to be used for preventing, destroying, or concontrolling fungi that may infest vegetation or be present in any environment whatsoever.

M. B. WAITE.

FUR Farmers Lose Many Foxes Through Infectious Disease The loss of fur animals through disease is one of the greatest obstacles that fox farmers have to overcome. Many diseases of foxes are caused by specific germs and by parasites. It is through the agency of these organisms that contagion and infection are spread from one animal to another and from one ranch to another. Since these diseases arise through the presence of germs or parasites, it is readily seen that preventive measures are necessary.

Whether or not infectious and contagious diseases are present is often impossible to determine because of serious complications, such

as parasitic infestation, dietary errors, insanitary conditions, or the injudicious use of toxic drugs. Rapid spread of disease in many cases has been due to failure promptly to isolate and quarantine foxes received from other ranches or returned from exhibitions.

Those who have studied outbreaks of disease on fox ranches usually find the cause to be the so-called distemper, with its variable manifestations. This is an acute contagious disease followed by a high rate of mortality, especially in pups. Adult foxes, however, commonly contract the disease and die. The symptoms are generally less pronounced and more difficult to detect than in dogs or other domestic animals because of the unfavorable conditions under which foxes have to be examined and of their strong tendency to conceal signs of distress. In fact, a large proportion of affected animals show no apparent symptoms of distemper until about to collapse.

Premonitory symptoms when pronounced usually include disinclination to eat and decreased activity. A clinical thermometer is of little value in diagnosis. Subnormal temperature readings usually predominate, and although increased temperatures are rare the nose is usually dry and warm even when the temperature is subnormal.

Nervous Symptoms Common

Nervous symptoms, particularly convulsions, are common and conspicuous in many outbreaks of distemper. As a rule, animals showing nervous symptoms die within a day or two; those that do not succumb in that time usually make a rapid recovery. Conjunctivitis, an inflammation of the mucous membrane of the eye, is present in some outbreaks, but the discharge from the eyes is rarely copious. A slight nasal discharge is fairly common and is generally associated with catarrhal pneumonia. For this reason râles and coughing are usually noticed in animals thus affected. Abnormal loosening of the fur and jaundice are common, and liver and kidneys may show congestion or degeneration. Intestinal symptoms include constipation or diarrhea and passage of blood-tinged mucus, the diarrhea usually being accompanied by rapid development of emaciation and anemia.

The gross lesions, like the symptoms, are extremely variable even in the course of one outbreak as well as in different outbreaks. Cases showing no apparent gross lesions, particularly in the early stages of an outbreak, are relatively common. Congestion and hemorrhage in the cortex of the brain and the coverings of the central nervous system are common in nearly all cases. Hemorrhage and congestion of the pancreas are frequent and may be observed also in the pericardium, pleura, peritoneum, intestinal mucosa, skin, and subcutaneous tissues, and enlargement of the spleen occurs frequently. In some cases the respiratory tract is involved and this condition results in congestion of the mucous membrane of the nose and catarrhal pneumonia. Catarrhal inflammation of the stomach and small intestine is also common.

Ante-mortem and post-mortem examinations in outbreaks of disease have aided in maintaining the health of foxes by indicating possible preventive measures. Intensive study of the bacteriology and microscopic pathology of such outbreaks is necessary to learn the direct cause of the trouble. Until further progress is made it is essential that all fox farmers maintain the strictest sanitary pre-

cautions about their ranches and that they utilize quarantine measures to the fullest extent when foxes become sick or when new stock is introduced or exhibition stock is returned from fox shows.

KARL B. HANSON and
FRANK G. ASHBROOK.

GAME Law Improves Wild-life Conditions in Alaska Vigorous enforcement of the new Alaska game law is reducing in a gratifying manner the unwarranted killing of the game and fur-bearing animals and birds that formerly prevailed in the Territory. Interpreting the attitude of the people toward conservation, the courts are regularly meting out to violators heavy penalties, including frequent jail sentences. So successful is the work of law enforcement proving that even under a reduced take of fur bearers, the total value of shipments of peltries from Alaska is increasing, and a larger breeding stock is left on the ranges. Changes in market conditions are in some measure responsible for the increased value of exports, but of even greater importance are changes in the open season dates and better enforcement of the law, by which the average quality of furs taken is being improved. By curtailing the annual take of game and fur the stocks can be built up until the productivity will be much greater than at present, a tenfold increase being considered by the Alaska Game Commission as well within the realm of probability.

The Alaska Game Commission, which since August 10, 1925, has been charged with the responsibility of protecting the game, land fur animals, and birds of the Territory, is composed of five resident members. Four of these come from the four judicial divisions, respectively, of the Territory, and are appointed by the Secretary of Agriculture, and the fifth member, who is the executive officer and fiscal agent of the commission, is the chief representative of the Bureau of Biological Survey resident in Alaska. The members representing the four judicial divisions are chosen for their interest in wild life and their standing in their respective divisions. Under the terms of the new law these commissioners each serve for four-year periods, one vacancy being filled each year. This insures a continuity of policy and freedom from politics that makes certain that the gigantic livestock business in Alaska's wild animals and birds shall be well administered.

The four members of the commission receive no salary except when traveling to or from or in actual attendance at meetings of the commission, and then only within certain limits fixed by the law. The meetings are held annually, about midwinter. At these meetings the commission formulates plans to be carried out by the executive officer during the ensuing year, prepares estimates of funds needed for the work, and considers criticisms and recommendations received regarding seasons, bag limits, game and fur districts, and other matters affecting the wild life of the Territory. Proposed regulations, based on these recommendations, are submitted for the approval of the Secretary of Agriculture through the Bureau of Biological Survey. The regulations approved become effective 90 days after publication. The commission promulgates its own regu-

lations regarding guides, resident hunting and trapping licenses and use of poisons, and administers the law and all regulations made for its enforcement

Field Enforcement Work

The field enforcement work carried on by the commission consists of an active patrol throughout the year by regular and special

Fig 97 —Alaska game warden with dog team, on trail in interior of Alaska

officers over an area nearly a fifth the size of the United States, one that if superimposed on the map of the United States would have its extremities as far apart as Savannah, Ga., and Los Angeles, Calif, and northern Minnesota and southern Missouri. Patrol of

Fig 98 —Power boat *Seal*, of the Alaska Game Commission Warden patrol in Alaska necessitates ocean travel, to visit remote islands and coastal districts in the interests of bird, game, and fur animal protection

a region so vast requires travel into remote mountains and tundra country and even extended ocean voyages. Conveyances employed are both primitive and modern, including dog team (fig. 97), pack train, canoe, river and ocean boats (fig. 98), automobile, railroad

train, steamboat, and airplane. The officers selected for this work are carefully chosen for their reliability, knowledge of wild life, and personality, and are given thorough training in wild-life enforcement policies and criminal-court procedure in Alaska. This results in a capable and efficient force of men who have the respect, good will, and support of a great majority of the people of Alaska.

As a whole wild-life protection in Alaska is progressing satisfactorily. Both game and land fur animals are being given such protection in the areas most subject to hunting that they are holding their own and in some sections are increasing. The waterfowl that nest in Alaska and go to the States and the Canadian Provinces in winter are not seriously molested and are protected so far as funds permit. Grouse and ptarmigan are extensively used locally for food purposes, but there is little disposition to slaughter them wastefully, and their protection is not difficult. The Alaska Game Commission and its field personnel are encouraged by the cordial and active support of Alaskans, who realize that the wild-life resources are one of the leading assets of the Territory and that without them much of the country would be entirely unproductive and uninhabitable.

ERNEST P. WALKER.

GIPSY-MOTH Territory Cut by Control Work; Quarantines Vital

The gipsy moth became established in the suburbs of Boston, Mass., in 1869. By 1889 it had become such a pest that the State of Massachusetts combated it vigorously during the following 10 years. Since 1905 the Federal Government as well as the infested States have carried on intensive work to bring about its control and to prevent its spread throughout the country. On account of its habit of feeding freely on the foliage of almost every species of tree, control work is extremely difficult. The female moth, however, does not fly, and the spread of the insect is limited to the transportation of egg clusters on shipments of plant products and other articles or the carrying of small caterpillars by the wind. The infested area has been placed under quarantine by the Secretary of Agriculture, and all shipments of products likely to carry infestation are thoroughly inspected before they are moved beyond the infested region. This has been of the utmost value in preventing long-distance spread of the pest.

Extraordinary efforts have been made to control this insect by importing its natural enemies from abroad. The first liberations were made in 1906, and 15 species of beneficial insects have now become firmly established. These increased in the field rather slowly, and as the habits of each species are different, and the conditions under which they would increase most effectively had to be determined after they were brought to this country, progress in their utilization has been rather slow. The results of this line of work, however, were encouraging from year to year, and led to an intensive effort to obtain additional beneficial species from abroad, and to utilize to the best advantage all those that have been able to maintain themselves in this country. The parasites continued to increase in numbers from the time of their introduction until 1924, during which year the areas defoliated by the gipsy moth were relatively small. Since that time, however, control by parasitism has reached a very low ebb, and the acreage defoliated in the eastern part of the infested area has rapidly increased.

Improved Field Operations

As a result of the intensive methods adopted to control this insect many improvements have been made in methods of conducting field operations. Experiments along many lines have been carried on for the purpose of developing the most effective means of control. It has been demonstrated that the addition of fish oil to the lead-arsenate mixture has made spraying far more efficient, as it prevents the poison from being washed from the foliage by rain. Tests have been made of the use of airplanes for dusting infested forests, but this work is still in an experimental stage. Spraying equipment has been improved, and motor trucks have been adapted to this work in recent years. Treatment of the egg clusters of the gipsy moth with creosote so that the eggs may be destroyed without removing them from the trees is a method that has been in use for many years and is very effective.

A serious gipsy-moth infestation was found in Somerville, N. J., in 1920, and an investigation showed that it originated through large shipments of ornamental trees from Europe prior to the passage of the plant quarantine act in 1912. Many trees had been killed in the center of this infestation. During the year following the discovery of this infestation over 3,000,000 egg clusters were treated. Owing to the intensity of the infestation it had been the center from which smaller colonies had become established in an area exceeding 400 square miles. Work was immediately undertaken in cooperation with the State of New Jersey, and since that time the infestation has been so reduced that no defoliation has been noticeable. The infested territory, together with a wide area surrounding it, has been thoroughly examined and treated and the infestation has been gradually reduced to less than half its original size. Satisfactory progress toward the extermination of the insect in New Jersey has been made each year.

In spite of the application of every improved method that could be devised, the gipsy moths continued to increase and spread in New England for a number of years. By 1923 conditions in the older infested area had improved but numerous infestations were found in western Massachusetts and Vermont and a few isolated colonies were found in eastern New York. In 1923 a strip of territory from 25 to 35 miles in width and 250 miles long, known as the barrier zone (fig. 99), was laid out in western New England and eastern New York, extending from the Canadian border to Long Island Sound. This area contained numerous infestations, and it was planned to clean up this zone for the purpose of preventing the insect from spreading throughout New York State and to the west.

Gipsy-Moth Scouting

The work in the barrier zone is being conducted by the Bureau of Entomology in cooperation with all of the affected States. The northern part of the zone is further protected by intensive gipsy-moth scouting and extermination operations carried on by the Canadian Government along its side of the international boundary. One infestation was found in Canada. East of the barrier zone each State carries on its own control work in cooperation with the bureau.

The territory within the zone is annually examined by crews of field men to determine the existing conditions, and all infestations which are located are thoroughly treated. This has resulted in the extermination of many gipsy-moth colonies and in greatly reducing the strength of the colonies where actual extermination is not accomplished in a single year. Such stubborn and persistent infestations are repeatedly examined and exterminative measures are

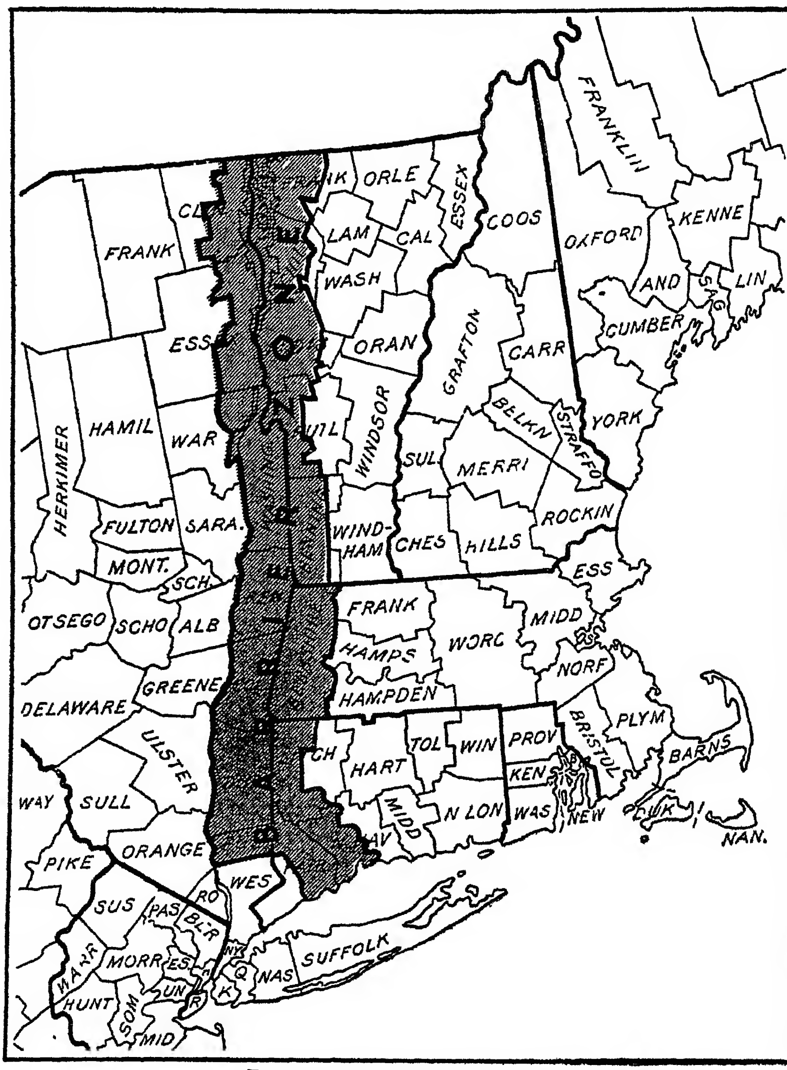

FIG. 99.—The gipsy-moth barrier zone

continuously applied. As an added protection, a few towns west of the zone, located in the direction of the greatest spread of the moth, have been examined and, except for three small colonies found in Ulster County, N. Y., and one at Greenwich, Conn., no infestations were located. These colonies and the one in Canada have been thoroughly treated and apparently exterminated.

Infested Territory Reduced

The work in the barrier zone during the past three years has shown a steady reduction in the extent of the infested territory. Progress has been so marked that it is now possible to release from intensive work small areas in New York State that were in the original zone.

Three vigorous colonies, however, were found in towns near Rutland, Vt., in 1927. These, which were in areas adjoining the zone to the east, were thoroughly treated. There has also been a serious increase in the acreage defoliated in the territory east of the Connecticut River during the past summer and a substantial increase in infestations between the river and the barrier zone line, aggregating about 215 per cent. This, coupled with a very low percentage of parasitism over the entire infested area, makes it appear that it will be extremely difficult to maintain the present excellent condition within the zone unless further protective work is undertaken east of it. The examination of this territory and the treatment of all existing colonies are imperative. While it is hoped that the introduced parasites will increase within the next few years so that the existing heavy gipsy-moth infestations may be substantially reduced, this condition can not be predicted with certainty.

A. F. BURGESS.

GRAPE Inspection a Material Aid to Fruit Auctions A new line of fruit-auction-inspection work was started in Chicago beginning August, 1926, and it continued until the end of the grape season. Inspections had been made in previous seasons of grapes, cantaloupes, and other products to be sold through the f. o. b. auctions, but the grape-inspection work in Chicago was the first undertaken in connection with produce to be sold through a delivered auction. Although car lots of grapes had been sold by the f. o. b. auction companies, on the basis of joint Federal and State shipping-point certificates, car-lot auction sales in a terminal market, with the auctioneer standing at the car door and prospective buyers congregating around him, presented a new picture. Prior to this time fruit-auction sales in the terminal markets had been held in a salesroom and the buyers usually examined the samples, which were on display in another room, before attending the sale.

The Bureau of Agricultural Economics entered into an agreement with the United States Fruit Auction Co. providing for inspection, for condition only, of all car lots of California juice grapes offered for sale by this company in Chicago. In consideration of the large volume of work offered, and as the auction company was not interested in the grade but only the condition of the grapes, the bureau agreed to furnish inspection service for $2.50 per car instead of charging the usual $4 fee. Another reason for the lower fee was the fact that the cars were placed for delivery in one railroad yard, which made conditions favorable for rapid inspection.

Inspections Based on Samples

The inspections were based upon the examination of a 9-lug sample taken from each car. A preliminary written report, giving

briefly the results of the inspection, was tacked on the side of each car prior to the daily auction sales. The buyers also had the opportunity of examining the samples before the sales began and had the privilege of making a casual inspection of the car lot from the doorway, if they so desired. The sample lugs were marked by stickers supplied by the auction company, indicating that the samples were "official," and were then placed for display on the pavement at the car door. The inspection certificates, giving detailed reports as to the condition of the grapes, were placed in the hands of the auction company not later than the next day after the auction sale. The terms of sale prescribed by the auction company provided that any claim arising from a dispute as to the variety of the grapes must be filed within 24 hours after the sale. The decisions rendered by the inspectors as to the variety were final and were binding upon both parties.

The services of four to six inspectors were required to handle this work, and they were busily engaged from early in the morning until noon each day. A total of 1,129 cars was inspected under the terms of the agreement in 1926. Both the buyers and the auction company expressed their approval of the services rendered by the Federal inspectors, who exercised great care in selecting samples that fairly represented the quality and condition of the cars of grapes from which the samples were taken. The written reports were of great value to the buyers, but the success of this new line of work can be attributed largely to the fact that the juice-grape buyers had confidence in the integrity and neutrality of the inspectors in selecting representative samples. As the agreement was renewed at the beginning of the 1927 season this phase of inspection work promises to become a permanent feature of the activities of the farm-products inspection service.

R. C. Butner.

GRAZING Control is Needed for Proper Watershed Protection On rough land, such as is ordinarily used for grazing, the herbaceous and shrubby plants that constitute forage for livestock help to check the movement of water on the sloping surfaces and to bind the soil against erosion. Grazing that destroys more or less of the plant cover not only reduces the capacity of the land to support livestock but may lead to damage by erosion and floods that is of far greater importance than the loss of the forage. The value of grasses and other low-growing plants for protecting watersheds may not be easily recognized because of the somewhat obscure manner in which such plants check surface run-off and erosion. The vegetation intercepts a small portion of the falling rain before it reaches the ground. The decaying plant material adds to or at least maintains the humus content and consequently the water holding capacity of the soil. The roots open up the soil to some extent and thus help the water to penetrate into the ground. The stems and leaves near the ground form physical obstructions to water as it runs down hillsides, reducing its velocity and increasing the chances of its being absorbed by the soil. The reduction of velocity and volume of run-off and the binding power of the roots check erosion.

On hillsides well covered with vegetation the run-off takes the form more or less of a sheet of comparatively clear water discharged gradually into the natural drainage channels. Such run-off does not contribute heavily to flood heads nor to the removal of soil from the slopes. On the other hand where grazing has materially reduced the plant cover and exposed the soil the run-off soon forms a system of gullies; the velocity and hence the eroding power of the water increases greatly in these gullies; the soil, gravel, and rocks torn loose and carried down add to the force and abrasive power of the water; and each succeeding storm cuts the gullies deeper, wider, and more directly down the slopes.

An Efficient Drainage System

The result is a highly efficient drainage system that discharges a large portion of the rainfall into the regular drainage channels in a very short period, carrying great quantities of soil and contributing materially to flood crests. Very often by the time the gullies in such a drainage system have become well established so much of the better surface soil on the slopes has been removed that it is difficult for new plants to take root, and in order to bring back the vegetation special measures such as terracing and planting may become necessary.

Since grazing is one of the common uses of herbaceous and shrubby vegetation and, when not carefully controlled, is also one of the most common causes of the depletion of such vegetation, it should receive special attention on watersheds. Under average conditions, where the cover has not already been reduced, grazing practice that will maintain the highest grazing capacity will also maintain the plant cover in a condition for satisfactory protection of the watershed.

Under special conditions, such as where the slopes are very steep, the soil is easily eroded, or the cover has already been seriously depleted, it will be the best plan, in the long run, to graze very lightly or not at all. Such areas are of doubtful value for grazing at best and the danger from floods and erosion may more than offset any small returns from grazing.

CLARENCE L. FORSLING.

GRAZING in Pine Woods if Excessive Checks Tree Growth

Grazing presents a difficult problem in the management of timber lands in many sections of the country. It has become a very acute problem in the western yellow pine forests of Arizona and New Mexico. When a timber crop is harvested, the first step, if the land is to be kept productive, is to restock it with young trees. Planting is expensive, and, therefore, reliance is usually placed upon natural reproduction from the seed disseminated by trees left for that purpose. Cattle and sheep eat young pine seedlings to such an extent that natural reforestation may be stopped over large areas. (Fig. 100.)

The problem might be solved by removing livestock from the forests, but practically there are objections to doing so. In most of the western forests, cattle and sheep growing were established indus-

tries long before foresters appeared on the scene. Drastic curtailment of these industries would cause local economic disturbances which it is desirable to avoid. The more open forest lands produce much forage, which constitutes a resource of considerable value. Moreover, it has been found that not infrequently moderate grazing aids reforestation by removing luxuriant herbaceous growth which competes with tree seedlings for light and moisture, harbors rodents and provides fuel for fires.

FIG. 100.—On the left of the fence heavy grazing by cattle and sheep has practically exterminated all pine seedlings, while on the right under more moderate grazing by cattle and horses the forest is restocking satisfactorily. In addition to the large saplings (11 years old), there are many small seedlings which are not visible in the photograph

Depletion of Forage Plants

The destruction of tree seedlings is often accompanied by depletion of the choicest forage plants. To a large extent, then, such measures as are necessary to conserve the range should also result in protection to young trees. Although conservative grazing will not eliminate damage to tree seedlings under all conditions, it will generally go a long way in that direction. If damage to forest reproduction does not cease with the application of good range management, further reductions in the number of livestock or in the length of the grazing season should be made.

Unless the forage is of very high palatability, it is seldom possible to utilize it completely without excessive damage to tree growth. However, it is desirable for the good of the range itself to leave a considerable amount of vegetation on the ground at the close of the season as a protection to plant roots and to prevent erosion of the soil. Where the range is heavily grazed the injury to forest reproduction is usually least at the time the grasses are green and succulent, and often the browsing of trees can be avoided by confining grazing to the months of active forage growth.

In the Southwest seedlings come up in appreciable numbers only at intervals of from 5 to 10 years, and in some localities the cumu-

lative efforts of 20 years are required to produce an adequate stand of young trees. Under such conditions, the loss of a seedling crop delays restocking much longer than is generally supposed. Therefore measures for controlling grazing must be taken in time or the opportunity of obtaining natural forest regeneration is likely to be lost.

Pine seedlings are most susceptible to injury when below 3 inches in height, for when bitten off in this stage they rarely recover. Under heavy grazing practically all seedlings may be exterminated before they are 3 years old, and unless careful examinations are made the loss may pass unnoticed until it is too late to apply the remedy.

G. A. Pearson.

Grazing of Range Gives Best Result When Conservative

Abundant feed is essential for satisfactory gains on steers, for keeping bulls and cows in vigorous breeding condition, and for assuring fat lambs and heavy wool production. The cheapest method of providing palatable and nutritious feed is by conservative grazing of the range, based on

Fig. 101.—Sheep on summer range in a national forest. Plenty of range feed results in large crops of fat lambs and a larger and cleaner wool clip

the principle of regulating the number of animals and the period of grazing on a given area in accordance with the forage producing capacity of the range. This is also the only safe use that can be made of range lands.

To enable forage plants to make good growth, set seed, and maintain their stand, the stocking of the range should be such that at the close of the grazing season at least 10 per cent of the herbage of the most valuable forage plants is left. In the Southwest, where periodic

droughts are to be expected, still more conservative stocking is needed. And in dry years calves will have to be weaned and sold early and the herd culled more closely in order to have sufficient forage to keep the breeding cows in vigorous condition.

Spring is the critical period of the year throughout the range country and there is greatest danger of inadequate feed at that time. If spring range is utilized too soon not only is the production of a satisfactory crop of feed prevented but cows often become so poor that, though they may not die of starvation, they fail to get into breeding condition during the year. Such idle cows are what have drained the profits from the cattle producer's pocket. Studies made at the Santa Rita Range Reserve in southern Arizona have shown that an average annual salable surplus, made up mostly of well-developed calves, equal to 60 head for each 100 head of cows grazed, is necessary if the range cattle industry in that region is to be profitable. Spring is also lambing time. The ewe then needs abundant feed to assure plenty of milk and a strong vigorous lamb.

Necessary Grass Development

Experiments at the Great Basin Experiment Station in central Utah have shown that the native bunch grasses in that region should

FIG 102—Adequate range feed for breeding cows assures vigorous breeding condition, maximum calf crops, minimum losses, fat calves, and top prices

be at least 6 inches high and that 25 per cent or more of the heads of the earlier maturing perennial grasses should be showing before the range is grazed. If possible, it is well to reserve a part of the range for use only during the spring period. In that way new growth is favored and some feed from the previous year may be used to aid in carrying the livestock through this critical period.

Fat grade steer calves on the Jornada Range Reserve of southern New Mexico, where conservative grazing is practiced, sold for $35 a head in the fall of 1927, and heifer calves sold for over $40. Not only were top prices obtained for calves, but the abundant feed assured for the whole 12-year period, maximum calf crops, minimum losses, and satisfactory growth of animals.

For best results it is necessary to know what plants of the main range types are the more valuable, what are their growth habits and requirements, and the extent to which they may be grazed one year with another without affecting their average forage production. Once these things are determined a plan of forage utilization may be developed which will provide the foundation for a stable and profitable range livestock industry.

W. R. CHAPLINE.

GUM Yields of Pines Increase Fast With Diameter Increase In view of the rapid increase in yield of gum for naval stores which accompanies increased size of slash and long-leaf pine timber it is usually the wisest policy to defer chipping trees until they are at least 9 or 10 inches in diameter. Young slash pines grow an inch in diameter in five years on medium quality soil, and for every increase of an inch in diameter there is an increase of nearly 6 barrels of spirits to the crop (10,000 faces). Long leaf takes roughly seven years to grow 1 inch, and the yield of spirits increases at about 4 barrels to the crop for each inch of growth. A crop of 7-inch slash pine, for instance, yields about 22 barrels of spirits, whereas 8-inch trees yield 28 barrels of spirits and proportionately more rosin.

This represents an increase of 27 per cent in five growing seasons, or a little over 5 per cent a year. In another five years these trees should yield 34 barrels of spirits, which is about the average yield of turpentine timber in Georgia and Florida. Each increase of 1 barrel of spirits and 3⅓ barrels of rosin to the crop is worth $89.21 at the average prices for turpentine and rosin which prevailed from 1922 to 1927. Furthermore, small trees are injured more severely than large ones by chipping operations. Frequently their growth is arrested so that they become an economic loss, never reaching a usable size for ties, poles, or lumber.

A glance at the figures given below should convince timber owners that it is to their advantage to see that small trees are kept unchipped.

Data on Yield Capacity Essential

Naval-stores operators also should know with some degree of accuracy the yielding capacity of the timber which they wish to lease for turpentining. If they purchase the turpentining rights on a block of timber composed of trees of all sizes they should know what the yields of the smaller trees will be in order to judge what is the minimum size tree from which a profit may be reasonably expected. Such knowledge properly applied will enable operators to reduce expenses and prolong the life of their operations. Turpentine men usually know about how much a crop of faces must yield in order that they may make a reasonable profit. Yield figures may help them determine what is the smallest sized tree which they can afford to work.

Yields for second-growth slash and long-leaf timber located in Bradford and Clay Counties, Fla., are given in Table 9. Trees ranged from 20 to 40 years of age. Only one face was placed on a tree regardless of size. Streaks were one-half inch wide and one-half inch deep. Thirty streaks constituted a season. Chipping was

regular, well done, and conservative. Slash figures are for first, second, and third-year work, long leaf for first and second-year work. The slash pine was of good grade; the long leaf was of a poorer quality.

TABLE 9.—*Naval stores yields from open-grown slash and long-leaf pine*

Diameter of tree in inches 4½ feet above ground	Average seasonal yield			
	Barrels of spirits per crop		Ounces of gum per face (dip and scrape).	
	Slash	Long leaf	Slash	Long leaf
5	11	----------	37	----------
6	17	----------	56	----------
7	22	13	74	51
8	28	18	93	69
9	34	23	112	86
10	39	27	130	104
11	45	32	148	122
12	50	37	166	139
13	56	41	185	157
14	62	46	204	175
15	68	51	223	193
16	73	----------	241	----------

Yields from Smaller Trees

Yields from smaller trees in crowded stands of timber are relatively poorer than the yields from trees of the same size grown in the open. Moreover, the yields given above will not be maintained if more than one face is placed on a tree, especially on the smaller trees. All yield figures are relative, and can not be applied indiscriminately. But with modifications these figures may be applied to other timber stands, and are an improvement over the old "rule of thumb" method of estimating naval stores yields. And they show one thing in particular; namely, that yield increases rapidly with size of timber.

LENTHALL WYMAN.

HAY-HARVESTING Cost Much Reduced With up-to-date Machinery

Wide variations in the efficiency of hay production are found on individual farms in the eastern United States. Some farmers harvest and store an acre of hay with four hours of labor, whereas on other farms more than eight hours of labor are required.[6] Evidently many farmers can improve their efficiency through improved methods in harvesting and storing hay. It is possible for them to do the work more easily and at the same time they can reduce their production costs.

The use of a side-delivery rake and hay loader effected a saving of approximately one and one-half hours per acre of man labor and one-half hour per acre of horse work as compared with the dump rake and hand loading from windrow. (Fig. 103.) With wages at 40 cents per hour this represents a saving of 60 cents per acre in man labor

[6] Data from studies of the cost of producing hay in Pennsylvania on file in the Division of Farm Management and Costs, Bureau of Agricultural Economics, U. S. Department of Agriculture.

alone which, with 30 acres of hay, amounts to $18 or more than enough to pay the interest and depreciation on the necessary investment in a side-delivery rake and hay loader.

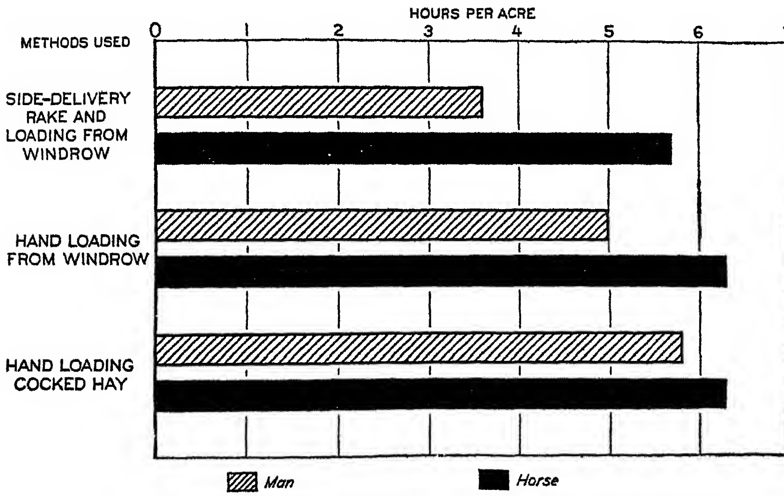

FIG 103 —Use of side-delivery rake and hay loader effected a decided saving

Loading by Hand Expensive

Loading hay by hand is a tedious and expensive method if there is much to be done. On the other hand, when the loader is used, a crew can handle considerably more hay and in an easier manner than when it is loaded by hand. (Fig. 104.) The double harpoon and the

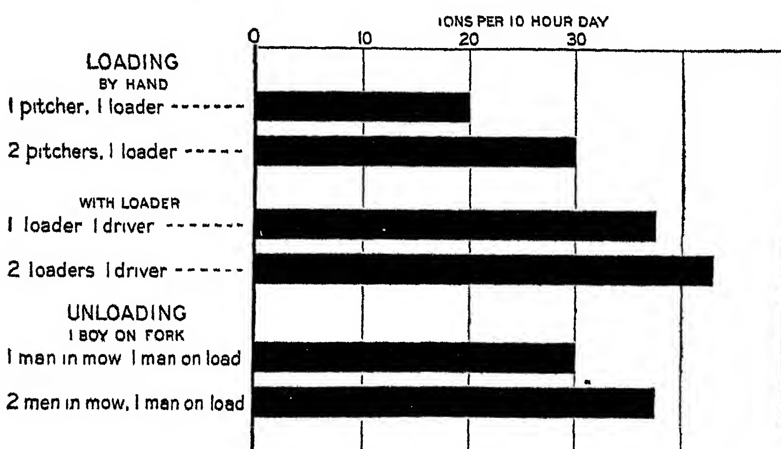

FIG 104 —When a loader is used a crew can handle more hay and can handle it more easily than when hay is loaded by hand

grapple fork will unload a load in about the same time (approximately 20 minutes), whereas slings require only about two-thirds as much time. Some farmers say this is about offset by the time lost in the field by adjusting the slings. Perhaps this is questionable. Where

slings are used the height of the barn roof must be sufficient to permit their advantageous use. A direct saving is made when two or more wagons are taken to the field, especially if the haul is long. In the former case the elapsed time is only a third to one-half as great The extra wagons are taken to the field and left standing, the same crew loading all of them.

The 5-foot cut is the most common size of mower in the East. On farms where there is sufficient acreage to be cut and the ground is fairly level and free from stones and stumps, it is economy to use the larger sizes. Under average conditions, a 5-foot mower will cut 10 acres in 10 hours, a 6-foot mower will cut 12 acres, and a 7-foot mower will cut 14 acres. The larger implements require more power, but this is usually available on farms where there is sufficient acreage to justify the use of the larger sized machines.

Loss in Mowing

Another considerable loss in time results when two or more mowers are used, one following closely behind the other. If a slow team happens to be in the lead those in the rear are compelled to follow more slowly than they otherwise would do. If one of the teams is delayed on account of a breakdown the other teams must stop while repairs are being made. A better mowing practice, if several machines are used, is for each driver to lay off a "land" for himself and work independently of the others so there will be no interference from other machines.

Many farmers are still using small one-horse rakes bought many years ago. Such rakes should be used only on small acreages. On farms which grow 40 or more acres of hay, a 12 to 14 foot rake should be used. With such a rake 50 per cent more ground can be covered in a day and the work is done more easily than with the smaller rake.

R. S. Washburn.

HEMP Varieties of Improved Type are Result of Selection

Methods of hemp selection devised in 1913 have been followed since with only slight modifications. The plots of different strains are placed as far apart as possible (40 rods or more) to avoid cross-pollination. The seed is sown early in April in drills 6 feet apart. The plants are cultivated as soon as the rows can be seen and about four times later. In June the plants are thinned to 10 to 15 inches apart in the drill. As soon as the staminate buds can be distinguished in August the plots are rogued. All plants of poor type are removed, and superfluous staminate plants are cut out. In September, when the plants have attained full size and the staminate plants have shed their pollen, notes and measurements are recorded for each pistillate plant as follows: Diameter, number of nodes and height to alternate branches (from which to compute length of internodes), total height, notes as to divergence from type. The tallest and best plants are tagged with their numbers and covered with a cheesecloth sack to protect the seeds from birds.

The plants are harvested late in October and the seed is threshed (beaten off) about a week later. The seed of each selected plant is

cleaned separately by means of a small fanning mill. The seed from the other plants is cleaned and sent in small quantities to hempseed growers. One pound, containing about 27,000 seeds, is sufficient to plant an acre of seed hemp with hills 5 feet apart each way.

The selected individual plants are subjected to further competition based on length of internode, total height, and weight of seed, to determine which ones will be used for planting the following season. Each row in the selection plot is grown from the seed of an individual selected plant of the preceding year.

Kymington

The variety called Kymington (Kentucky-Minnesota-Washington, from the origin of the seed and places of development) is a result of

FIG. 105.—Initial selection plot of Kymington hemp, averaging 9 feet 11½ inches in height, from seed of a single plant of Minnesota No. 8. Arlington Experiment Farm, 1914.

successive individual selections from the progeny of the best single plant of Minnesota No. 8 grown in 1912. This mother plant was 10 feet 6 inches tall. The 311 plants in the initial plot of 1914, on clay loam upland at the Arlington Experiment Farm, averaged 9 feet 11½ inches in height. (Fig. 105.) Each plant selected to furnish seed for the following year was taller than the mother plant of 1912. The average length of internodes in this initial plot was 4.37 inches. These measurements increased until 1923, when the average height was 16 feet 9¼ inches and the average length of internodes was 5.94 inches. (Fig. 106.) Since 1923 the measurements have declined somewhat, due in part to unfavorable soils and seasons, but in all instances the average measurements have been above those of the original plot, and in 1927 they were slightly better than in 1926.

This variety has been grown extensively by Kentucky hempseed growers, some of whom have kept the seed pure.

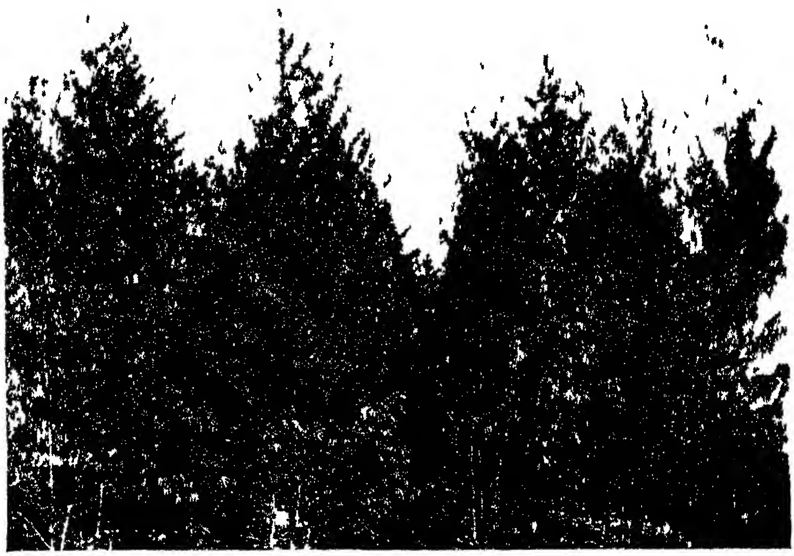

FIG. 106.—Kymington hemp, averaging 16 feet 9¼ inches in height, an increase of 60 per cent by nine generations of selection. Arlington Experiment Farm, 1923

Chington

The Chington (China-Washington) variety has been developed by successive individual selections from the progeny of a single plant in 1913. The seed was received from Hankow, China, through the Office of Foreign Plant Introduction and given the S. P. I. number 35251. It was planted in the testing garden, and unlike most of the numerous introductions of hempseed, it gave promise of value. It averaged 5 feet 11 inches in height, and the best single plant from which seed was saved was 10 feet 6 inches tall. Seed from this best plant was sown at the Arlington farm in 1914, and the annual selection has been continued. This strain also reached its greatest development in 1923, when it averaged 16 feet 8 inches in height with internodes averaging 6½ inches. A few plants attained a height of 20 feet. Since 1923 the measurements have declined a little, though remaining always above those of the mother plant of 1913 and the average of the initial plot of 1914. With the slight reduction there is greater uniformity.

The Chington variety has been grown extensively by hempseed growers in Kentucky, and in some instances efforts have been made to keep it pure. Large fields of fiber hemp sown with pure Chington seed are remarkably uniform and give good yields of excellent uniform fiber.

Ferramington

The Ferramington variety has been developed by successive selection from the progeny of a cross made in 1916. In that year a row of Ferrara, the best hemp of northern Italy, was grown in the plot of Kymington, and all of the Ferrara staminate plants were removed before they shed any pollen. (Fig. 107.) Seed from the best Ferrara

plants was saved, and this has been grown and selected at the experiment station at Madison, Wis. The cross was made for the purpose of combining the earliness and smaller diameter of stalks of the Italian hemp with the greater height and longer internodes of Kymington. This result has been achieved after many years of selection to eliminate diverse types from the progeny of the cross.

This Ferramington has been tried in Wisconsin, where it gave a very good crop nearly two weeks earlier than the main hemp harvest. It has also been tried near Bologna, Italy, where it produced fiber fully equal in quality to that of the Ferrara hemp grown in the same field, and about 1 foot longer.

FIG. 107.—Origin of Ferramington hemp. Row of Italian Ferrara pistillate or seed bearing plants in plot of Kymington. Arlington Experiment Farm, 1916

Arlington

The Arlington variety is being developed by successive selection of individual plants from the progeny of a cross made in 1919 between Kymington as a pistillate parent and Chington as the staminate parent. It shows increased vigor both in growth and in production of seed, and the stalks are slender and more elastic than those of any of the other varieties. It is a little earlier than either of the parent varieties, both of which are later than most of the hemp from unselected Kentucky seed.

LYSTER H. DEWEY.

HIDES and Skins to Be Standardized as Aid in Marketing

Late in the fiscal year 1927 a new project was started in the Bureau of Agricultural Economics for the purpose of developing standard market classes and grades for domestic hides and skins. The need of better raw material is an active subject for discussion, the best quality raw stock produces the finest quality of leather. There is also a great need on the part of the hide and skin producer to be able to clearly identify his product and to realize more for his efforts in the skinning and curing operations.

Standard classes and grades promise to eliminate much of the confusion now caused by the loose use of class and grade terms and by flat (ungraded) buying. Flat buying penalizes the producer who maintains a high standard for it does not give him the proper return for his best hides and skins.

Hides and skins are the most important of the raw stock used by the tanning industry and are a by-product of the meat industry. The larger packers have standard methods of skinning, curing, grading, and marketing their hides and skins. Their careful supervision insures a high standard in the take-off and curing processes. Hides and skins from the packers, therefore, are the most desired by tanners because the yield of leather is higher.

Standardization of hides and skins is fundamental to improvement. With clearly defined market classes and grades for this commodity the producer could keep informed as to the wants and needs of consumers and he would take more pains in the skinning and curing processes because if they are standardized, the better grades of hides and skins will bring the higher price.

There are many factors which affect the utility and value of hides and skins. They may be classified as those which are the result of handling and those which are solely the result of natural processes.

Mechanical defects are the result of unskilled or improper handling during the skinning and curing processes. With a little care and skill such defects can be eliminated. It has been felt that too much stress has been put on these defects in the present grading rules but it is true that some hides and skins are taken off in such a way that almost the entire surface is covered with cuts and scores. Many lots of hides that originate in the small rural sections contain almost 90 per cent of cut or badly scored hides and skins.

Aggregate Loss Heavy

To the individual producer the economic loss is not great but it is estimated that the total loss sustained by producers in this country because of faulty take-off, curing and other damage is \$10,000,000 to \$20,000,000. (Fig. 108.)

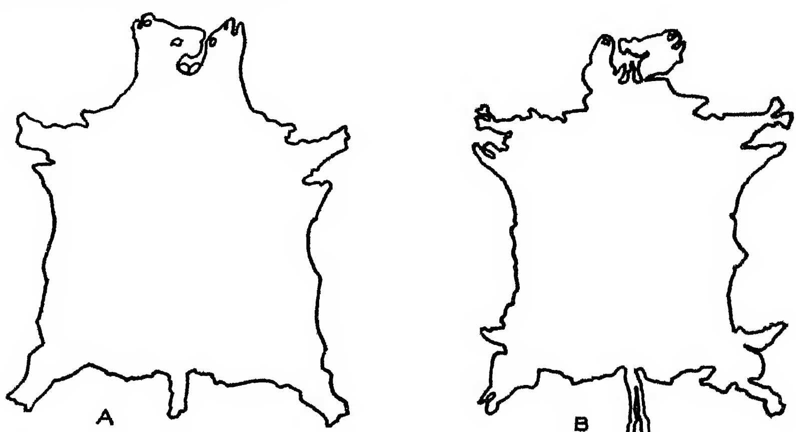

FIG. 108.—The difference between a hide of good pattern and one of poor pattern and trim. A, note the clear cut edges and contour. B, observe the irregular outlines, the poorly shaped head, the split shanks and tail. Poor pattern hides require a great deal of trimming which results in considerable waste.

Physical characteristics are inherent in the animal which produced the hide; they differ with each class of animals. They are determined by climatic and other conditions prevailing where the animal was born and raised. The best animal from a beef standpoint will not always drop the best hide or skin, judged from a leather standpoint. Size, shape, smoothness, substance, thickness, weight and plumpness are also basic factors in determining grade. Quality, hardness, tightness and fineness of grain are important. The influence of breed, sex, and age must be recognized. The correlation of qualities with utilization must be given attention.

Pest infestation, or the ravages of insects and pests on the live animal, greatly affect the quality of the hide and of the leather produced. The effect of these pests can not easily be seen when the hair is on, but in the finished products the appearance of the leather is affected as are the utility and wearing properties.

When standard market classes and grades of hides and skins are formulated, promulgated and used the producer will benefit by receiving a higher price for his better grades of hides and skins and thus will have an incentive to produce raw material of a better quality. The consumer will benefit through a higher yield of leather and less loss from badly damaged material.

M. C. Brown.

Hog-Cholera Immunity a Safeguard in Best Management of Herd

An outbreak of hog cholera needs for a start only hog-cholera virus and a susceptible pig. After that the infection will find a way to spread to other susceptible pigs that may be on the premises or near by. Hog cholera spreads in a great variety of ways. Experience has shown that satisfactory control of all the means of spread is impossible. Sanitary practices alone can not be trusted to control an outbreak of hog cholera nor to protect susceptible pigs exposed to it.

Fig. 109—Suckling pigs can be immunized more cheaply and more conveniently than older hogs

Immunization of susceptible pigs by the proper use of virus and serum will establish lasting, high-degree resistance against the disease. Both sanitary measures and immunization practices must be used if losses are to be curtailed and maximum efficiency obtained in the production of hogs.

Swine of any age—pigs or hogs—may be given lasting immunity by the use of suitable doses of potent hog-cholera virus and anti-hog-cholera serum. The dosage is based on the weight of the pig to be treated. The convenience of applying the treatment likewise depends on the size and weight of the pig. (Figs. 109 and 110.)

When immunization is to be practical, a good time for establishing it, all other conditions being favorable, is within the month following the last farrowing date, spring or fall. It is not a good plan to treat only a part of a herd. All susceptible animals should be immunized at the same time. It is preferable to immunize nonpregnant rather than pregnant sows.

When the breeding herd is already immune, the pigs are born with a high degree of immunity, but this gradually disappears until at weaning time a safe immunity probably no longer exists. During the suckling period the pigs may be conveniently and economically treated for lasting immunity.

Dangers of exposure to the virus of hog cholera are so great that there is no plausible reason for attempting to maintain a breeding herd of hogs which is susceptible. The cost of immunization represents but a fraction of the losses which hog cholera involves whenever it appears.

FIG 110.—Heavy pigs require more serum and more help for immunization

Sanitary practices, however, should not be neglected because the hogs are immunized. Control of other diseases, parasitic and otherwise, the attainment of general thriftiness and good husbandry demand the exercise of cleanliness and care in the management of hogs.

S. S. BUCKLEY.

HOG Cholera Not a Menace to Herds Properly Immunized

That experience is a costly teacher was forcibly illustrated in the farming communities of the Middle Western States in the fall of 1926. For several preceding years hog cholera had gradually subsided to a point where it caused little concern to hog growers. A feeling of security had developed. Even in the face of repeated warnings that a serious

outbreak might recur at any time and that the menace was ever present unless precautionary measures were adopted and followed, farmers in the districts having dense hog populations were not impressed with the importance of keeping their herds immunized. Repeating its history, cholera became unusually prevalent in the fall of that year and, before a sufficient amount of serum could be produced to meet the unusual demand, more than a million hogs had died of the disease. (Fig. 111)

Thorough precautionary measures against hog cholera include every safeguard that may prevent the introduction of infection and every means possible to eliminate the disease when it appears. Successful swine growers know that sanitation is important in the raising of livestock. They also have learned that hog cholera is no respecter of conditions. A herd kept under the best sanitary conditions succumbs to cholera as quickly as one kept under less favorable conditions. It is a matter of susceptibility. The hog raised under sanitary

[illegible] The disease is highly infectious and causes more deaths than all other swine diseases combined

conditions is just as susceptible as the one confined to filthy quarters, but the former is better able to withstand the effects of disease.

Various factors are responsible for the spread of hog cholera, some of which are well known and others still obscure. But the outstanding feature in controlling the disease is that swine acquire a lasting immunity through use of the preventive-serum treatment, thus being protected from dangerous factors, both known and unknown. There is a growing tendency among progressive hog raisers, especially those of the Corn Belt, to immunize their pigs regularly as soon as they reach the proper age. Experience has shown that anti-hog-cholera serum will protect against the disease, and raisers are adopting the positive method. (Fig. 112.)

Problem of Complete Eradication

Some persons have asked why the National Government and the States do not proceed with the view of eradicating hog cholera completely. While such an accomplishment is very desirable, due consideration should be given to problems involved, the measures that

would be necessary, and their effects on the swine and other industries. The nature of hog cholera, its rapid spread, and high mortality rate rank it as the most dreaded disease of swine and there is not a State in the Union free of it.

Efforts to stamp out cholera would mean the restricting of importations, the destruction of exposed and diseased herds, the cleaning and disinfecting of infected farm buildings and equipment, public stockyards, railroad loading yards and cars, boats and motor trucks, and the quarantining of most of the area of each State, thus restricting the movement of hogs for any purpose.

The task of eradicating foot-and-mouth disease in localized areas, as has been done on several occasions, was light compared to what would be encountered in stamping out hog cholera. The fact that it cost approximately $9,000,000 to eradicate the 1924 outbreak of foot-and-mouth disease in a comparatively small part of the State of California gives an idea of what it would cost to eradicate hog cholera in our 48 States. Furthermore it would be difficult, if not impossible, to obtain the services of a sufficient number of competent veterinarians to direct the operations in addition to the disease-control work that is now being done.

FIG. 112.—Immunizing a young pig against hog cholera

England for a number of years directed its efforts to the eradication of hog cholera by the slaughter method. Even with the backing of laws and regulations rigidly enforced the enterprise proved to be a failure and was abandoned on the recommendation of a special commission appointed to consider the matter.

Present Control Measures Effective and Economical

In view of the extent of cholera infection in the various States, the vast territory involved, the tremendous cost, the effects of eradication measures on swine raising and other industries, and the fact that we now have an effectual, preventive treatment against cholera which can be used at reasonable cost, both State and National officials feel that the time has not yet arrived for this country to undertake such drastic measures for the eradication of hog cholera. It could not be expected that under present conditions swine growers and livestock organizations would approve a rigorous, expensive campaign of eradication, and in order to be successful it is essential that any attempt along this line have the willing cooperation of all concerned. In all probability the time will come when hog cholera will be opposed as vigorously as we are now fighting tuberculosis of animals and the southern cattle tick.

In the meantime, with the present knowledge of the principles of sanitation, swine diseases, and the feeding and care of hogs, it is possible to reduce greatly the yearly losses from cholera and other ailments and make hog raising even a more safe and profitable enterprise than it is now considered.

Immunization of swine against hog cholera is a dependable preventive. Almost twenty years of application in the hog-raising sections of the world have proved its worth. The use of serum alone for temporary protection and the simultaneous treatment to confer lasting immunity were both developed and tested thoroughly at the experiment station of the bureau and under field conditions before they were given to hog raisers. If either treatment is used properly in connection with other essentials in swine husbandry losses can be held to a minimum.

U. G. Houck.

HOG-CHOLERA Serum of Three Types Now Available for Use Three types of anti-hog-cholera serum now are available for use in hog-cholera prevention. When prepared by the original methods the product consists of defibrinated blood of hogs made hyperimmune to cholera and a solution of carbolic acid which is added to prevent the product from spoiling. This product is sometimes referred to as "whole-blood serum," "bloody serum," "defibrinated-blood serum," and the like, but the last name is the most descriptive and appropriate, since this type of serum has the appearance of blood and in fact is blood from which the fibrin or clot has been removed. The true or protective serum content of this type constitutes 65 per cent of its volume, while the remaining 35 per cent is of a nonprotective nature, consisting of about 25 per cent blood cells and 10 per cent preserving solution.

Descriptions of the Three Types

During recent years the methods of preparing anti-hog-cholera serum have been modified, resulting in the preparation of a clear product. This serum is prepared in both unconcentrated and concentrated forms. Clear, unconcentrated serum is of the same relative potency as defibrinated-blood serum in like volumes, sterile normal salt solution being added to replace the blood cells which are removed during the process of clarification. This clear, unconcentrated serum is variously referred to as "filled serum," "refined serum," "diluted serum," "clarified serum," and "clear serum," but the name "clear, unconcentrated serum" is the most applicable.

Clear, concentrated serum contains the protective properties of the product in larger quantities than do any of the other types of serum. The nonprotective cells and inert portions removed in the process of refining or clarifying hyperimmune blood are not replaced, so that the finished product is less bulky and consists of over 80 per cent protective serum. This type is referred to as "concentrated, clear anti-hog-cholera serum," or "concentrated anti-hog-cholera serum." Clear serums are not so dark in color as defibrinated-blood serum and may vary in color from an opalescent or straw color to a slightly reddish or wine color. As the absence of blood cells in clear, concentrated serum reduces its bulk and makes its heating practica-

ble for the purpose of destroying bacteria, thereby improving its purity and keeping qualities, it is the most satisfactory type of serum for hog-cholera prevention.

Labels Give Useful Information

All immediate or true containers of serum prepared under the supervision of the United States Department of Agriculture (fig. 113) must bear approved trade labels. Knowledge concerning the requirements for such labels will serve to acquaint the user with the type of serum before him. Each label must bear the true name of the product in a conspicuous manner but different qualifying terms may be used by the producer in connection with the true name of the product.

Fig. 113.—Bottling anti-hog-cholera serum in an inspected plant. Each type of serum is clearly labeled

Defibrinated-blood serum is usually labeled "Anti-hog-cholera serum," and clear serum is generally labeled "Clear unconcentrated anti-hog-cholera serum," or "Clear concentrated anti-hog-cholera serum." The gross quantity of serum in each bottle and the percentage of true or protective serum content in the quantity given must appear immediately following the true name of the product. This information appears on the 500-cubic-centimeter container commonly used for defibrinated-blood serum and clear, unconcentrated serum in the following form: "Quantity 500 cubic centimeters containing 65 per cent protective serum."

The statement for clear, concentrated serum is as follows: "Quantity 500 cubic centimeters containing 80 per cent protective serum." The labels also bear a date after which it is not recommended that the product be used. For ordinary and unconcentrated serum this date is limited to two years after the date on which the serum is prepared, but on account of the higher quality and protective properties of concentrated serum a three-year date is permitted for it. Labels also bear a table stating the minimum doses which the department permits to be recommended for the type of serum involved. The minimum doses for defibrinated-blood serum and unconcentrated serum are 25 per cent larger than those for concentrated serum.

The department permits licensed establishments to use approved paper caps and metal seals for the purpose of identifying their prod-

ucts. The caps are marked "U. S. released" and bear the license number of the producing firm. The seals bear the letters "U. S." and are furnished by the department and applied under the supervision of its inspectors.

R. E. HOLM.

HOGS Fed Garbage Produce Pork That Has Good Quality The question of garbage disposal is one which is more or less perplexing to those in charge of sanitary matters in many of our cities. Much of the garbage produced throughout the country is used in the feeding of hogs. There are many different methods of collecting and disposing of garbage. Some cities provide for the collection of garbage, delivering it, at a designated point, to a contractor who arranges for its disposal. Other cities allow the garbage feeders to do their own collecting. Sometimes garbage is paid for, especially that of hotels and restaurants.

Hogs can be fattened successfully on garbage if it contains a sufficient assortment of feeds so that the hogs can select a balanced ration. Corn, ground barley, wheat, or rye may be fed with garbage, thereby producing more rapid gains, but the cost of production also is increased when any of the grains are added.

Tests have shown that pork from garbage-fed hogs is as good as that from corn-fed hogs, and commands as good prices on the market.

Composition of Garbage Is Variable

There is a considerable difference in the composition of garbage in the different cities and at different seasons of the year. For instance, in summer, it contains a larger percentage of vegetable matter than in winter. Meats in garbage are more abundant in winter than in summer; as a consequence the winter product is the more concentrated feed and produces more pounds of pork per ton. To be of the best feeding value garbage should be collected frequently and fed promptly.

The location of the farm where garbage is to be fed is a matter that should receive careful consideration. (Fig. 114.) Soils that drain readily are to be preferred. A sandy or gravelly soil is better than a heavy loam or clay soil. Likewise, rolling land is preferred to level land because of drainage. Hogs fed on garbage should be as carefully and comfortably housed as hogs fed in any other way.

It is much better to feed raw than cooked garbage. If it is cooked the hogs have no choice other than to eat the composite mass that results, but if fed raw and scattered on a platform, as it should be, a hog may choose such parts of the garbage as are valuable as a feed and leave the remainder. Portions of the garbage, such as citrus-fruit rinds or coffee grounds, are valueless as a hog feed.

Feeding Value of Garbage Varies

Naturally there is considerable variation in the feeding value of different lots of garbage, but one may safely estimate that with the average run a pound of pork can be produced with 50 pounds of

garbage. The richer garbage from hotels and restaurants will show considerably better results.

There is always danger from hog-cholera infection when feeding garbage, and hogs should always be protected against the disease by treatment.

FIG. 114.—An insanitary garbage wagon and undesirable conditions for hog feeding

FIG. 115.—Garbage should be fed on clean feeding platforms and under sanitary conditions

Most successful hog feeders using garbage as a feed prefer to raise their own pigs rather than to buy them. They have found that sows fed on garbage during the gestation and suckling periods produce pigs which make better average gains than when fed with other feeds. Other successful garbage feeders follow the plan of adding corn or barley to the garbage ration during the suckling period. This keeps

the sows in better condition and in consequence the pigs are in better condition at weaning time.

Some garbage feeders who purchase their pigs have rather heavy losses while getting them on garbage. It is recommended that, when pigs are purchased, the change from their accustomed grain feeds to garbage be made very gradually, taking as long as four weeks to complete the substitution. An abrupt change of feed is apt to produce digestive troubles that may be fatal to some of the pigs.

It probably is best to have concrete feeding floors (fig. 115), if practicable. A floor of this kind is more easily kept clean than a wooden floor, but the latter is desirable under certain conditions. For instance, when garbage is fed in fields of considerable size on which various farm crops are produced, wooden platforms are necessary. The feeding platform of wood is movable and may be hauled from field to field.

Refuse is Valuable Fertilizer

The refuse from the garbage after the hogs have finished eating is plowed under, and makes a valuable fertilizer. The same care and attention should be given to sows during the gestation and suckling period, when fed on garbage, that is given to those fed in any other way. Some garbage plants pay little or no attention to the comfort of the sows during these periods. This neglect results in a small number of pigs per sow, which are weaned at very light weights and consequently are not in condition to go on feed and make profitable gains.

E. Z. Russell.

Hog Feeding to Avoid Soft Pork and Lard

Softness in pork and pork products—that condition which, when it exists, is disagreeable to so many consumers—is of real concern to several other classes of people. These include the farmer, the packer, and the dealer. The farmer's interest, of course, is primary, and the one under consideration here. He produces the pork and is the first to feel the effects of the public disapproval or approval of the quality of his product. When suspected of softness, hogs are usually bought by the packer at a reduced price, or at least purchased subject to cooler test of the chilled carcasses. If the latter are found to be soft, settlement is made on a soft-hog basis.

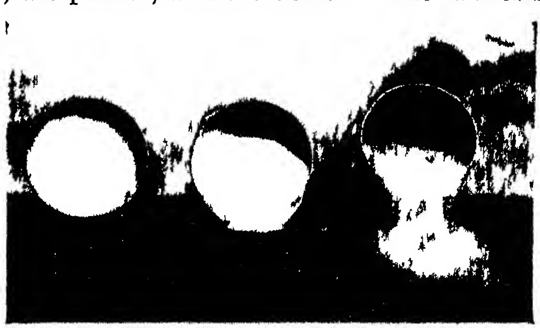

Fig. 116—Lard from A, firm, B, soft, and C, oily carcasses

There has been a lack of knowledge of the different factors responsible for softness in hogs and their products (fig. 116) and of the exact conditions under which softness develops. There is still need for much more information on these questions. To develop additional facts the United States Department of Agriculture and a number of the State experiment stations are continuing cooperative investigations which have been in progress for several years.

On the other hand, there is now available to the farmer considerable authentic information which can be of much value to him. For example, there is no question as to the softening effects of soy beans, peanuts, rice bran, and rice polish. Excepting soy beans these feeds are ordinarily fed as the principal feed in the ration. As such they produce softness in the carcass under all usual conditions. Soy beans, though possessing distinct softening influence, are best fed as a supplement to corn or other starchy concentrates, which are hardening.

Feed, Weight, and Rate of Gain

In consequence the question of the influence of different proportions of the softening and hardening feeds in a ration immediately arises. It is known that pigs weighing approximately 100 pounds can not be fattened on a 2.5 per cent ration of shelled corn with soy beans grazed or self-fed without producing soft carcasses. In fact, a combination of corn and soy beans containing 25 per cent of soy beans has consistently produced soft carcasses under carefully controlled conditions with pigs weighing up to 130 pounds in starting weight and gaining approximately 100 pounds on the corn-soy-bean ration. Even a 6 to 1 mixture of the two feeds, which contains but 14 3 per cent of soy beans, has shown itself to be softening under certain conditions. One condition is when the initial weights are not over 90 pounds and the daily gain not more than 1 pound through any feeding period up to about 100 days.

Fortunately, however, when this same 6 to 1 mixture is fed to pigs starting at 115 pounds or more and gaining not less than 1.5 pounds daily for a minimum of 70 days firm carcasses are produced. This is one illustration of the fact that when properly used with corn, soy beans will not induce softness in hogs.

It is significant that softness and immaturity or lack of finish are closely related. Thus even pigs fed corn with nonsoftening supplements usually yield soft carcasses when slaughtered at about 100 pounds weight or less. However, with increase in weight and finish there is a gradual hardening on such a ration. At weights above 125 pounds carcasses of satisfactory firmness are usually found. This applies to hogs of medium to large type, as do other statements made in this article.

Brewers' Rice a Valuable Hardening Feed

Hardening of hogs previously fed on softening feeds ordinarily is accomplished somewhat slowly. Much depends, of course, upon the degree of softness developed and the weight and finish when hardening is begun. Helpful information is available on various phases of this question.

Brewers' rice is a producer of extremely firm hogs. It possesses great possibilities as a hardening feed and as a supplement to softening feeds. The feeding value is high.

The above facts show the kind of information which has been and still is being worked out for the benefit of the swine producer. It will enable him to produce hogs of high quality which meet market requirements and which will not be subject to price discriminations.

O. G. HANKINS.

HOG Industry Losing Much on Pigs That Don't Get to Market Swine raisers market only 56 per cent of the pigs farrowed on their farms and get no direct benefit from 14 per cent of the feed fed to their hogs on this account. This was indicated by a study made on five years' operations of a hog farm by the United States Bureau of Animal Industry. The management practices on this farm are believed to be typical of hog farms in general. If that is true, here is a leak that has much to do with profits or lack of profits in the pork-producing industry.

It is apparent to any hog raiser that some pigs will be lost regardless of the care exercised, but few farmers realize the extent of the toll taken by dead pigs unless they have made a special study of it. Since the causes of many of these losses are factors that can be controlled by the farmer himself, it should be helpful to know what the findings on the farm studied show regarding how the individual farmer may greatly reduce or entirely avoid such losses.

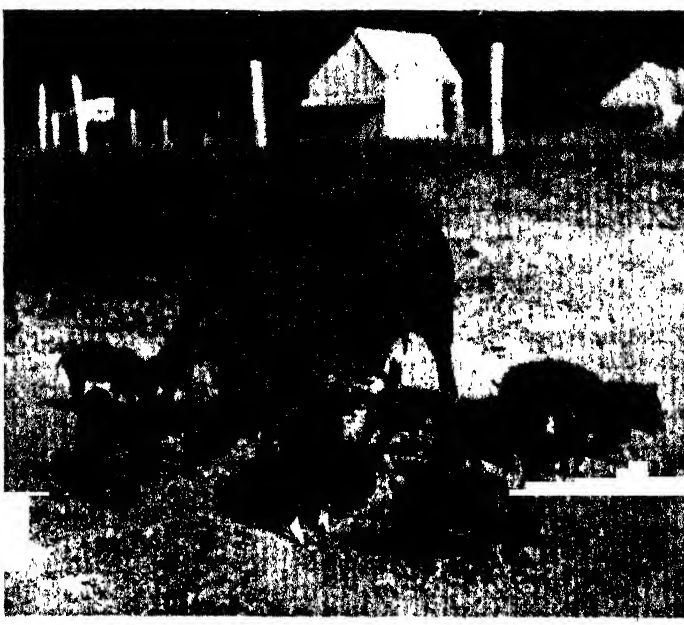

FIG. 117.—Large litters of thrifty pigs at weaning time tend to increase hog profits. At 1927 prices, each pig farrowed dead cost \$2.80 for feed and every pig dying between birth and weaning time an addition 3½ cents for each day which it lived

Losses During Suckling Period

It was found, for example, that each pig farrowed dead cost 140 pounds of feed and that a pig dying at any time between farrowing and weaning represented a loss of 1¾ pounds of feed for each day it lived. (Fig. 117.) The losses during the suckling period, including pigs farrowed dead, amounted to 36 per cent of all pigs born. From weaning time to market the percentage of loss was smaller, but the cost per head of each pig gradually increased with age. For instance, the feed cost per pig per day during the eight weeks immediately

following weaning was approximately 2 pounds, while for the next eight-week period it averaged 4⅓ pounds and for the final or finishing period it was increased to 7 pounds of feed per pig per day. During these periods the actual losses averaged as follows:

	Per cent
From farrowing to 10 days following (including pigs farrowed dead)	27½
From 10 days following farrowing to weaning	8½
During next 8 weeks	4½
During next 8 weeks	3
During balance of time until marketed	½

Based on these figures, in order to market 100 hogs it would be necessary to farrow 179 pigs.

Care of Sows

These studies show that more careful management of the breeding herd, closer attention to sows and pigs at farrowing time, and the practice of better disease prevention and control methods will tend to lower mortality rates and contribute to greater vigor and efficiency in the pigs saved. Since a large part of the deaths occur at the time of birth and during the following 10 days, it is evident that efforts toward reducing the death rate must begin with the sow. Sows selected for breeding purposes should be free from extreme nervousness and irritability. They should be carried on a suitable ration during the period of gestation and be given ample exercise. Farrowing quarters should be sanitary and provided with guardrails to prevent mashing of the little pigs.

The young pigs and their dams during the suckling period should be limited to clean ground, such as a fresh pasture, so as to avoid danger of roundworms and other filth-borne diseases. The pigs should remain in such a place until they are at least 4 months old.

Immunization by the use of anti-hog-cholera serum will protect against cholera. Close supervision of all operations by a careful and well-informed owner will do much to bring greater returns and more satisfaction from the swine-raising industry.

C. D. LOWE.

HOG Profits Rest Largely on Care Brood Sows Get To produce a crop of pigs that are to be fed out to a profit, one must, of course, have good breeding animals. But even though he may have well-bred stock, he must use the right methods in management and feeding during the gestation and suckling periods. One of the greatest essentials for brood sows during the gestation period is plenty of exercise. To accomplish this a good plan is to require the sows to roam over a field to obtain part of their feed.

This question has been given considerable study, and various experiments have been conducted at the United States Animal Husbandry Experiment Farm at Beltsville, Md. The plan that has proved to be most successful is briefly outlined here.

Economical Method of Feeding

When the sows are bred, they are placed in a field of about 15 acres which grew corn during the past year. Had a larger field been

available it would have been used. After the sows clean up the corn which has been left in the field they are given their corn ration during the entire gestation period by scattering shelled corn thinly over practically the entire area. In this way they gather only a small amount at one time, chewing it thoroughly and do not get too much, because they become tired traveling around and picking up only small quantities at a time. A sufficient amount is thrown out at one time to last the sows about a week.

Good third-cutting alfalfa hay is placed in a rack where it will be accessible at any time. Sixty per cent tankage or fish meal is also placed in a self-feeder so that the sows may eat it as they desire. In addition, a limited quantity of middlings or shorts is fed once daily in dry form in troughs, usually about 1 pound per hog per day. The quantity of shelled corn given is determined by the condition of the sow as the gestation period progresses. Usually about a 2 per cent ration will be sufficient—that is, 2 pounds of corn per 100 pounds of body weight of the sow. If the sows are not taking on sufficient flesh, the amount may be increased. It may be thought that by following this method too much tankage would be consumed, but this has not been found to be the case. On a percentage basis the feeds consumed by about 62 sows during the gestation period for spring pigs of 1927 was as follows:

Feed	Per cent
Corn	68.14
Middlings	15.47
Tankage	10.37
Alfalfa hay	5.85
Mineral	.17

Proportion of Protein Consumed

Naturally, sows during this period should consume a greater percentage of protein than they would during a fattening period. However, the percentage of protein feeds consumed by this system has not been excessive. These sows had a water supply from an automatic waterer during the entire period and were housed in ordinary hog houses with plenty of good, dry bedding. The sows were confined to their farrowing pens three days before they were due to farrow and treated according to the McLean County system of swine sanitation. The usual precautions at farrowing time are followed. The sows are not given anything to eat for the first 24 hours, and then the feed is gradually increased until the sow is given all she will clean up nicely. She should be back on full feed about 8 to 12 days after farrowing.

Three years of careful experimental work at the Beltsville farm has shown that the system of placing sows with their litters on self-feeders during the suckling period has not only proved to be better from the standpoint of the condition of the sows and pigs at weaning time but it has also shown a distinct saving of feeds. When the sows are on full feed after farrowing they are placed in a lot, sometimes with only two or three sows and sometimes with 12 or 15 on the same self-feeder, which contains shelled corn, tankage or fish meal, shorts or middlings, and a mineral mixture. (Fig. 118.) In this way the sows may eat any of the various feeds at any time they desire. After the pigs are about 3 weeks old they begin to eat and obtain their feed from the same self-feeder as the sows.

Access to Pasture Desirable

If pasture is available, it is always best to give the sows and pigs access to it. (Fig. 119.) The pigs should not be weaned until they are 10 weeks of age, and it is often desirable and beneficial to wait

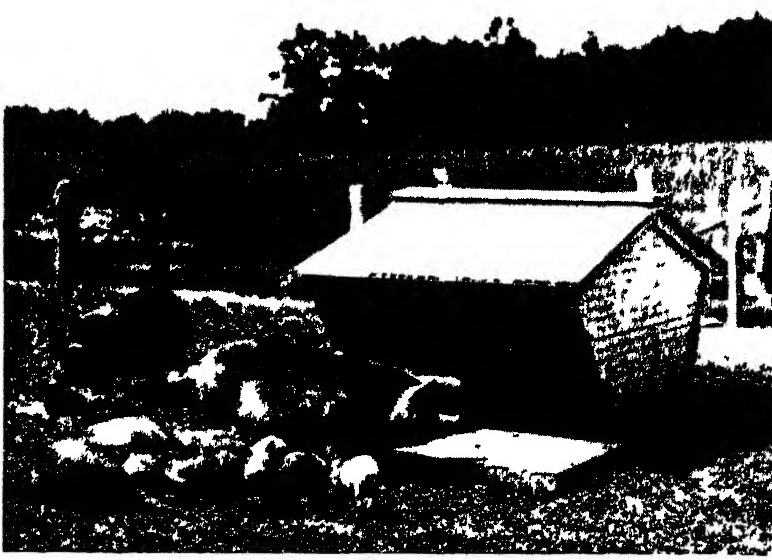

FIG 118 —Sows and pigs at self-feeder, illustrating equipment and types of animals

until they are from 12 to 13 weeks old. Weaning the pigs is very easy and successful under this plan of feeding. When weaning time approaches, a fence about 3 feet high is built around the feeder. Two

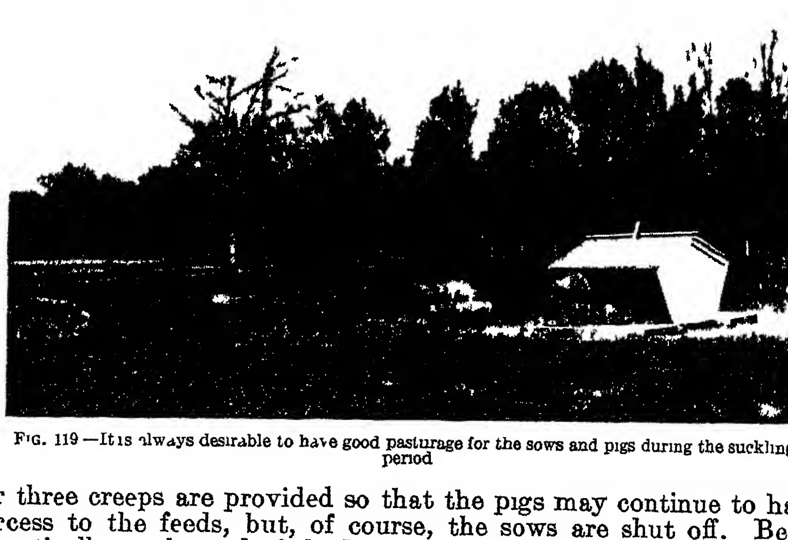

FIG. 119 —It is always desirable to have good pasturage for the sows and pigs during the suckling period

or three creeps are provided so that the pigs may continue to have access to the feeds, but, of course, the sows are shut off. Being practically at the end of the lactation period the sows will soon dis-

continue giving milk when the feed is taken from them. Usually the pigs will not try to nurse after three or four days from the time the sows are shut off their feed. The sows can then be driven away and the pigs allowed to remain on the feeders as they have been during the whole suckling period. This plan has produced fewer runts than any other system tried.

E. Z. RUSSELL.

HOG Raising by One or Two Litter System Is Feed Supply Problem The production of either one or two litters from a sow during the year are fundamentally the only two systems of hog production, although many variations and combinations of these two systems are used. Usually the one-litter system employs young gilts as breeding animals in the production of spring pigs, the time of farrowing coming early or late, as desired. After weaning time the sows are usually fattened and sold and a new breeding herd is selected from their offspring. The two-litter system usually employs old sows and gilts as breeding animals, and the spring farrow must be early so that fall litters may be weaned before cold weather. As old sows pass their usefulness for breeding purposes, they are replaced by gilts from the stock hogs.

A variation from these systems is the production of one litter from gilts the first year and two litters from the sows, or the entire herd may be carried over without the production of fall pigs. Three litters may be produced during the year by keeping two distinct breeding herds—one of tried sows under the regular two-litter system and another of gilts producing late spring pigs under the one-litter system. This one-litter herd then becomes the regular two-litter herd for the following year.

The distribution of the one and two litter systems in the Corn Belt follows closely the production of corn, the one-litter system being used most extensively where corn production is high and the two-litter system where it is lower.

Iowa, eastern Nebraska, northwestern Illinois, and States on the north of the Corn Belt follow more generally the one-litter system. Ohio, Indiana, central and southern Illinois, Missouri, southern Iowa, and Kansas follow more generally the two-litter system. The quantity of corn produced on a farm is the result of three factors: (1) The yield of corn per acre, (2) the percentage of the farm area in corn, and (3) the size of the farm. Thus a small farm with a high yield may have as much corn to market as a larger farm with a lower yield. As the quantity of corn to be marketed per farm changes, the method of marketing it through hog production, cattle feeding, or cash sale changes.

Reasons for the Two Systems

There are good economic reasons for these systems of hog production. A given quantity of feed is most efficiently utilized in pork production when the two-litter system is followed and the pigs are fattened to lightweights. This system is followed most extensively where there is a relatively small quantity of corn per farm. The farmers are short on corn and the system must be economical with the supply. Under such conditions the quantity of corn and other feed grains is the limiting factor to increased hog production.

Many Corn Belt farmers are long on corn. Apparently they can not raise hogs in sufficient number to consume the quantity produced. They dispose of their corn less economically by following the one-litter system, growing heavyweight hogs, producing beef, and selling corn for cash. With them corn is not the limiting factor to increased hog production; it is the equipment and labor available on the farm for raising more hogs. Specialized hog farms represent attempts to overcome this limiting factor. On the general run of farms the spring pigs are grown to heavyweight by winter feeding. If the two-litter system is followed, three groups of hogs must be housed and otherwise cared for—the fattening spring pigs, the recently weaned fall pigs, and the breeding herd for the next spring crop. A much greater investment in housing, equipment, hog lots, and pasture than is found on general Corn Belt farms would be necessary to care for these groups of hogs.

The one-litter system has some advantages under the conditions found on the large farms of the Corn Belt. The spring farrowing may be later when more sows may be cared for with less labor and equipment because of more favorable weather. The pigs need not be fed full rations of high-priced corn during the summer. Large quantities of corn may be hogged down. The corn crop may be marketed from six to eight months sooner than if fed to early spring pigs raised for the early fall market. Because of the lower seasonal price of corn, the late spring pigs may be fed to heavier weights before the point of diminishing return in feeding is reached. If steers are fed, late spring pigs are usually well fitted to follow them in the feed lot.

The price relationships of corn and hogs in different phases of the hog cycle and in different seasons of the year must be considered in following any system of production. Adjustments in spring and fall production should be made according to the price which will probably prevail when the hogs come to market. These adjustments should affect only temporarily the system of production. Every hog producer should keep clearly in mind that the greatest quantity of pork can be produced from a given quantity of feed by following the two-litter system of production and fattening the pigs to lightweights.

OSCAR STEANSON.

HOLLY from China Suited to Wide Area in the United States

Nearly 20 years ago an elderly missionary stationed at Shanghai, China, collected a few seeds of a red-berried evergreen shrub about 100 miles northwest of that city. He sent these seeds to the Department of Agriculture at Washington, where they were identified as a kind of holly (*Ilex cornuta*) and assigned a plant introduction number (24638). From these seeds a number of plants were raised, constituting the first successful introduction of this holly into the United States, although it had been grown to a limited extent in European gardens for a number of years.

It is an evergreen shrub, attaining under favorable conditions a height of 8 to 15 feet, with a dense, compact, bushy habit, sometimes wider than high. The dark glossy green leaves are of variable size and shape, ranging from 1 to 4 inches in length and from 1 to 3 inches in width. In shape the leaves are mostly oblong, with four

large spines at the corners; the specific name, *cornuta*, refers to the "horned" appearance of the upper ends of the leaves. There is also a terminal spine which is sharply reflexed and often one or two pairs of smaller spines along the margins. The number of these spines, which are very stiff and needlelike, varies from five to nine, but on the upper branches of old plants and on most of the branches of occasional plants the spines are much fewer or sometimes even absent. The small dull-white flowers, which appear early in the spring, are inconspicuous, but are followed in the fall by the small clusters of very conspicuous and handsome large red berries. (Fig. 120.) These are a third of an inch or more in diameter and are larger than those of the common eastern holly.

As the staminate and pistillate flowers generally are borne on separate plants and only the pistillate ones produce berries, it is necessary to include at least one staminate plant in each group in order

FIG. 120—Branches of the Chinese holly filled with berries. (From a shrub growing at the United States Plant Introduction Garden, Chico, Calif.)

to insure fertilization of the pistillate flowers and the consequent production of berries. This holly can be grown from cuttings of ripened wood or by budding on young seedlings, so it is possible to know whether the plants are staminate or pistillate by keeping a record of the plant from which the cuttings or buds were taken.

In China the shrub grows wild throughout the southeastern and south central Provinces from Kiangsi to Hupeh.

Tests covering several years in the United States have shown that the Chinese holly may be successfully grown over large areas. It has proved hardy as far north as Philadelphia in the East, and it does well in California and the Southern States. It is not as hardy as the common eastern holly (*Ilex opaca*), but excels the latter as an ornamental because of its larger deep-green leaves and larger berries.

It is well worthy of a place in every collection of ornamental plants in mild-wintered sections where a rather low, compact evergreen is desired.

PAUL RUSSELL.

HOME Maker's Time May Be Economized by Use of Schedule In spite of all we hear about the leisure of modern women, the home maker on the farm still has plenty to do and a little over. So many demands, in fact, are made upon her time that she often has the sense of being driven by her work—of trying in vain to "catch up" with all she has to do.

This pressure of work, of course, is as old as farming itself. But fortunately the housewife of to-day has found a new way of relieving it She is taking a lesson from industry and scheduling her work. And though the term may sound forbidding, the procedure is quite simple. For a schedule of house work is merely a written plan of work for the week, showing just what tasks are to be done each day and the hours for doing them.

In drawing up her schedule the home maker's first step is to make a list of all of her regular tasks, including even those which come only once in several weeks. Before each task she indicates how frequently it is done—whether daily, twice a week, every third week, or otherwise. And after each item she enters the time that it requires, recalling the number of minutes or hours she usually takes to do it. Some of her estimates, of course, will be extremely rough, but by keeping a record of her time when she does these tasks again she can correct her earlier figures. If there are many items about which she is uncertain, she may find it well to keep a record of all of her time for a week, before going on with her schedule.

When her statement of work is completed, she is ready to make the schedule itself. Keeping her list before her, she distributes the various tasks through the seven days of the week, arranging the work for each day in the order in which it is to be done and placing before each task the time of starting and finishing it. Considerable juggling of items back and forth will usually prove to be needed before each day will run smoothly, with meals and other "fixed" matters coming at the proper time. Jobs which are done less often than once a week can be scheduled for the same hours, so that some of them can be tended to every week.

Leeway for Interruptions

It is not only her routine work, however, which enters into the schedule. Periods for rest and leisure and for irregular work are also written in. And in every morning and afternoon a little time must be allowed for the ever-occurring but never-expected interruptions of housekeeping. For unless this leeway is provided the home maker will frequently find that she is "behind" her schedule, and much of the value of using it will be lost.

But the advantages of scheduling do not come wholly from making the work run smoothly. Even more gain is often made through reducing the amount of work to be done. For there is no better way of finding where time can be saved in housekeeping than by setting the situation down in black and white. Almost without realizing it, the housewife will begin to revise her list of customary tasks. Some of them, she will decide, can be done less frequently without sacrifice to anything but habit. For others the time can be cut down by simplifying her standards or by doing the work more efficiently; and a few, perhaps, she can cross from her list entirely, turning them over to others in the family or using instead the commerical or ready-made product.

Such a revision of the schedule from the standpoint of saving time obviously can not all be made at once; but by keeping her eyes open for possible changes the home maker can gradually reduce the demands of her housekeeping.

HILDEGARDE KNEELAND.

HONEY for Consumer Reaches Markets in Three Main Forms Honey is sold in three forms—extracted, section comb, and bulk comb. Since the passage of the pure food law in 1906, and especially since the sugar shortage during the recent war, when there was far greater profit in extracted honey than in comb, the extracted has been produced much more extensively than has section comb honey. Bulk comb, consisting of comb cut from a shallow frame and placed in a jar or can with the comb and surrounded by liquid honey, is popular in the South, especially in Texas, and is of increasing importance in the Intermountain States. Five and 10 pound pails and 1-pound glass jars are the usual containers for bulk comb.

FIG. 121.—Extracting honey. The man at the left is uncapping a comb preparatory to placing it in the extractor in the middle of the picture. Uncapped comb is being held above the extractor. Five-gallon can and empty supers in foreground

Honey should be thoroughly ripened in the hive before it is extracted; otherwise it is liable to ferment. If the combs are well capped and if the honey weighs 12 pounds to the gallon, its maturity is taken for granted. In the process of extracting, after the cappings of the cells have been cut off, centrifugal force is used to throw the liquid honey out of the combs against the sides of the extractor. (Fig. 121.) These combs are then returned to the bees to be filled again with honey. Most large beekeepers use a settling tank so that such bits of wax, pollen, and other foreign matter as may be present can rise to the top and be skimmed off. In addition, the honey is often strained through cheese cloth as a further precaution

against foreign matter before placing it in the bottle or can in which it is sold.

Perhaps the most popular container for honey is the 8-ounce glass jar. The 5-ounce and 1-pound glass jars are also popular, and where families buy honey as a staple food the 5-pound and 10-pound pails, with friction-top cover, are preferrred. Commercial beekeepers generally pack extracted honey in the 60-pound can with a small screw cap, often shipped two cans to a case, with a division board between them. Southern beekeepers still generally prefer large barrels, holding 30 to 32 gallons, especially for the darker grades of honey. Kegs holding 160 pounds are frequently used for buckwheat honey in New York State. Granulated buckwheat honey in New York City is often sold by the retailer in small veneer trays, such as are used for lard.

An attractive label that contains the beekeeper's name and address, and perhaps his brand, is frequently seen on glass jars and small pails. On the larger cans, some beekeepers add another label, or furnish the information in the form of a circular, explaining about granulation and telling something about honey and how it is used. Honey from some flowers granulates much more quickly than does that from others, and directions for making it liquid again by heating in a water bath are often furnished.

Packing Comb Honey

Comb honey is usually packed 24 sections, weighing 11 to 15 ounces each, to the case. Wooden cases with glass fronts to display the sections to advantage on store counters are customary, but in some areas an increasing amount of comb honey is packed in cardboard cartons. Twenty-section cases are popular with beekeepers in parts of Vermont. Before packing, propolis is removed from the sections, and they are graded according to finish, color, and weight.

As combs are fragile and delicate, care in handling is necessary to prevent the sections cracking and leaking. Small lots of comb honey are frequently put up in carriers holding eight cases. In larger shipments the cases are so packed in the car as to prevent injury by the shaking of the car. Straw is usually put in the bumper end and on the floor of the car to lessen the damage from jolting.

West of the Mississippi River most honey is shipped away from the point of production in car lots, and many hundreds of carloads leave this territory, chiefly to be marketed in the eastern part of the United States or for export to Europe. East of the Mississippi River most honey is sold by the beekeeper in less than car lots, either direct to the user or to a dealer who in turn sells to the consumer. There are many exceptions to both general rules. Many full carloads are shipped by eastern beekeepers, and much direct selling is done in the West.

Many carloads of honey are sold through brokers who get orders from large bottlers, bakers, confectioners, and wholesale grocers. This method of sale usually results in quicker disposal of the crop than when the beekeeper or beekeepers' association sells direct to bottlers, wholesalers, or other buyers, but the price is likely to be lower.

Beekeepers who sell through near-by grocers sometimes assist the dealers to dress their windows or to hold live-bee demonstrations.

Sometimes they make a selling trip through a territory, advising purchasers that future supplies can be bought at a certain store. School children and others frequently take orders, receiving 10 to 20 per cent of the selling price as commission.

Roadside Stands Increasing

Roadside stands have become important in the sale of honey. Beekeepers on well-traveled roads often sell their entire crop of thousands of pounds of honey to passing automobilists and buy from other beekeepers to fill the demand. Attractive stands, with signs leading to them for at least half a mile, and high-quality honey, well packaged, will make the buyer remember where he bought. (Fig. 122.)

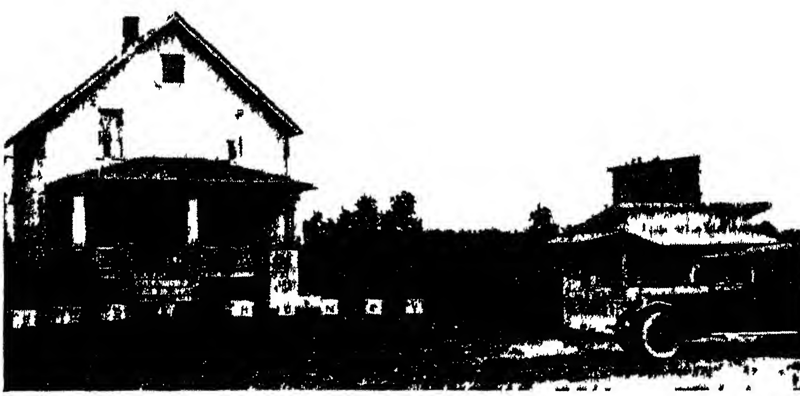

FIG. 122 —Roadside stand for selling honey On important highways these stands are becoming increasingly numerous and dispose of a large volume of honey

Candy manufacturers use many carloads of honey in nougats of various kinds, in candy "kisses," and in combination with coconut or peanut butter. Bakers use honey chiefly in cookies or jumbles, but occasionally in cakes and in "health bread." For these purposes the darker honeys with strong flavors are generally used. Occasionally candy makers prefer white orange or other mild-flavored honey. Some soft-drink manufacturers mix honey in their products, getting sweetening and flavor at the same time. Ice-cream manufacturers are experimenting with honey for sweetening, and some are using it regularly, especially for sherbets. When cane sugar is used in sherbets it precipitates rather quickly, and so the product must be sold promptly. Honey, being an invert sugar, does not crystallize when mixed in sherbet.

Honey is healing and soothing, and some hand lotions are advertised to contain honey. Manufacturers of cough syrups and similar preparations provide an outlet for a small amount of honey. Many people buy bottled honey solely to use clear or mixed with lemon juice as a remedy for coughs and colds.

H. J. CLAY.

HORSES Used in Big Teams Give Flexible Power and Cut Costs Production costs are vital factors in a farmers' ultimate income. One large factor in production over which the farmer has control is his motive power for performing farm operations. During the last decade there has been great improvement in farming practices but, on the other hand, little change in methods of using teams of horses until the last few years. Farmers of the Corn Belt have continued to use the hitching methods which were generally in vogue 20 years ago. Although standards of living have advanced, modern conveniences have been installed, better cropping methods employed, and improved livestock introduced, the farmer's ingenuity has not been directed until recently to one highly important factor in reducing operating costs—that of using more horsepower without increasing outlay for labor.

Both yield and cost of production are favorably influenced by the use of large teams. The man who uses an eight-horse team can plow about 8½ acres, disk 40 acres, or harrow 80 acres in a day. This rate of preparation enables him to get his seed planted when soil and weather conditions permit, thus increasing the yield per acre and at the same time reducing cost.

The use of large teams is not a new thing. It has been in use for many years in the great wheat-producing areas where horse-drawn combines have operated with big teams of from 30 to 40 horses with one driver. It is now known that the system used by the great Wheat-Belt operators in hitching and driving their combines can be successfully employed in various-sized hitches and be adapted to Corn-Belt machinery, moreover eliminating side draft and managing varying sized teams with one pair of lines.

Scheme of Hitching Simplifies Driving

Driving is simplicity itself because the wheelers are "tied in" and "bucked back," hence, automatically controlled. Light-link halter chains with snaps in the ends are best to tie the wheelers to the traces ahead; ropes or straps can be used to "buck back." Allow some slack and the horses will quickly adapt themselves to the system, and in a very short time they will learn to drive themselves better than any driver can do. The slowest horses should naturally be put in the wheel group and the prompt horses in the lead. The general plan is called tandem hitching and the general scheme of hitching is the same for either large or small units, the adjustments being made in the eveners, which are so simple that they can easily be made at home.

Tandem hitches eliminate side draft which always has been the bane of all horse users in horse operations. There is a true center of draft on plows, which means that it takes less power to pull the plow when the team is hitched directly in front of that point. It is impossible to hitch 4, 5, or 6 horses abreast on gang plows and have the center of the evener directly forward of the true center of draft without working some of the horses on plowed ground. This is hard on horseflesh and is prevented by the tandem hitch, in which the leaders are equalized against the wheelers by a chain-and-lever equalizer. The tandem hitch places the line of draft at true center, reduces the pull to a minimum, and gives the horses ample room in

FIG. 123.—Big eight horse team pulling a four section disk harrow. Note the space between horses, which permits them to be worked comfortably during hot weather

FIG. 124.—Big 12-horse team pulling a four-bottom plow speeds up the farm work

which to work comfortably. Figures 123 and 124 show the general scheme of hitching large units.

Demonstrations have been given in various States by the State agricultural colleges in cooperation with the Horse Association of America, showing how to make the various-sized hitches at home, and how simply they operate. The use of these hitches is increasing rapidly in many States.

This is the day of efficiency. The young farmer of to-day is not satisfied in doing things in the same old way. He wants to tackle a job and get it done as quickly and as cheaply as possible. If he is a good farmer he wants to do this work cheaply as well as efficiently. Instead of turning over one furrow with a two-horse plow, or cultivating one row of corn, the present-day farmer wants to turn over two or three furrows and cultivate two or three rows of corn in one operation.

Big hitches point a way to a practical way of effectively reducing operating costs, yet retaining on the farm the reliable form of drawbar power which is self-replacing, consumes home-grown fuel, and has the maximum of flexibility.

J. O. WILLIAMS.

HOUSEWIFE'S Time Has Varying Money Value on Different Tasks To many a housewife of a generation ago the idea that her time had a money value would have seemed absurd. But the modern home maker takes it quite for granted. In this day of ready-made clothing, baker's bread, and commercial canning and laundering, she is accustomed to deciding whether to spend her time on a household task or to spend the family income on its commercial substitute. Frequently she also weighs the question of paying for hired help in the home. There is plenty of opportunity for her to see that by doing her work herself she is saving money for the family.

Although she is fully aware that her time is worth something in dollars and cents, she has usually only the haziest notion of what this value is and of how it varies for her different tasks. Yet more definite information here would be decidedly worth having. For in choosing the particular tasks on which she will spend her time, she frequently needs to consider the effect on the family pocketbook.

With some of her tasks, of course, she has no choice; they must be done in the home, and the housewife herself must do them. Others she will prefer to do for reasons quite remote from the question of dollars and cents. But on many an occasion when she is debating whether or not to do a particular job, she could make a wiser choice if she knew how much money she saved by doing it, and how much time it took to make this saving.

Few Data Now Available

To get this information, however, she must be her own investigator, for almost nothing is known at present concerning the subject. Starting first with the tasks in which she is most interested, she must keep track of the time and money she actually spends in doing the work herself, including the time and car fare spent in purchasing supplies and the cost of owning and running any equipment which she uses. She then must carefully estimate the time and money

she would have spent had she bought a commercial substitute of similar type and quality or hired a domestic worker whose results are about as good as her own. From the amount of money saved and the amount of time used in saving it she can calculate what she is worth per hour in this particular task.

Frequently she will find herself happily surprised at the size of the figure. In a number of such studies recently made by a small club of home makers, several showed results between \$2 and \$2.50 an hour, and over half gave figures of more than 50 cents. Yet 50 cents an hour is a higher value than many an efficient home maker has thought her time was worth. And a figure of over \$2 an hour for even a few of her tasks would have seemed quite out of the question. In fact, the greatest benefit of such studies as these to the housewife may often come from a fuller appreciation of her own contribution to the family finances.

How high a value she finds for doing a particular task will depend in part, of course, on how quickly she does her work. In doing the family wash, for example, as compared with paying piece-prices at a commercial laundry, two home makers showed results of about \$2 an hour for each of the several weeks for which they kept their figures, while two others making the study earned only half as much. Since all of the four used similar equipment and similar laundering methods, the contrast was probably largely due to different speeds of work.

Little Value in Some Tasks

But no matter how quick a worker the housewife may happen to be, for some of her tasks her time is worth very little. In general, she can expect to find a lower money value when the use of machinery has cut the factory-labor costs to a minimum; the home maker can not compete with a thoroughly mechanized industry. In the studies made by the home-makers' club, the laundry figures were fairly high for even the slower workers, for piecework commercial laundering demands much ironing by hand. Two studies of making silk dresses also showed high figures, and here again the factory product is not wholly run off on machines.

With the simpler, more standardized jobs, however, a different story was told. In making a cotton house dress, for instance, the home maker found that her time was worth only 30 cents an hour, for the ready-made equivalent would have cost little more than the price of her materials. And in a study of canning fruit, a saving appeared of only a few cents an hour, for the supplies for the home-made product cost almost as much as the price of the best commercial brand. Had the home maker raised the fruit herself or purchased it at a bargain, her return on the time expended would, of course, have made a better showing.

Such figures as these, it is clear, do not have the degree of accuracy required in strictly scientific studies. For it is often difficult to select the particular grade of substitute most nearly equal in quality to the home maker's own product. And sometimes none can be bought which is fully as good as the home maker's. But for the practical, every-day purpose to which they are to be put, the figures are satisfactory; they can help the housewife use her time to the greatest financial advantage.

HILDEGARDE KNEELAND.

INCOMES of Farmers in 1926 as Shown in 4,799 Statements Judging from conditions as observed and reported during the growing and harvest season, 1926 seemed likely to be a year of increased income for farmers, continuing the gradual improvement of the four preceding years. Farm prices were running lower than in the summer of 1925, but outlets appeared to be good and it was expected that increased volume of production together with the higher prices of meat animals and fruits and vegetables would more than offset the lower farm prices. In December, however, a summary statement of the estimated gross value of crop production confirmed a growing conviction among farmers that 1926 was not so good a year as had been counted on. Production was greater, but prices were so much lower that the estimate of total value was nearly a billion dollars less than the estimate for 1925.

At the end of the crop year, with the value of livestock production added to the value of crops estimated using weighted prices, the disparity between the years, and for the country as a whole was only 0.4 per cent in favor of 1925. But, as farmers know, the gross value of production greatly exceeds gross income.

For the industry as a whole, the estimated gross income from farm production in 1926–27, was $12,080,000,000, or 74 per cent of the estimated gross value of farm production, the other 26 per cent having been used for feed and seed or wasted in one way or another. The percentage so used has varied from 25 per cent to 35 per cent in the past eight years. Further, 12 to 15.5 per cent of the gross value figure is regularly used by the farm families and amounted to $2,531,000,000 in 1926–27. This is real income, but is not money to spend. Cash income from sales was $9,549,000,000, or 58.6 per cent of the gross value of all farm production in the year 1926–27. In the past eight years it has not exceeded 60 per cent of gross value of farm production and was 55 per cent or less in four of the eight years. Compared with 1925–26, cash income from sales of 1926–27 was 4.6 per cent less.

Business expenses are met out of the sum called cash income from sales, as are the farmers' family and personal expenses. Payments to others for wages, taxes, rent, interest, and operating costs amounted in 1926–27 to about 70 per cent of the cash income. Thus 30 per cent of the cash income was available for ordinary living expenses not provided from the farm supplies, and other personal purposes. In the previous year, 33 per cent of a larger sum had been available for living and personal purposes. For the year 1926–27 the personal income of farmers, including noncash items, was 8 per cent less than in 1925–26 and the cash income available for personal purposes was 13 per cent less.

Some farmers, of course, made more in 1926 than in 1925, and farmers in some localities averaged quite as much. But reports from farmers for their own farms show plainly that 1926 was a less favorable year for them than 1925.[7] (Fig. 125.)

Direct comparison of the years 1925 and 1926 is possible through the statements of 4,799 farmers for the same farm in each of these two years. The receipts of these farmers averaged $13 more in 1926 than in 1925, expenses were $37 more, inventory increase was $84 less and the net results were $108 less—$986 in 1926 compared with $1,094

[7] See Tables 475–476 in statistical section, Farm Returns.

in 1925. In all the geographic divisions the average cash balance for these farms was smaller in 1926 than in 1925, as it was for the larger groups of which they are a part. The increase in average total expense was largely in the labor bill. There was considerable variation in the averages of all classes of expense in the geographical divisions even though the general averages changed little.

A sorting of reports from the South Central States, where the reported average net result was higher in 1926 than in 1925, shows that the improvement was attributed to farms and ranches where

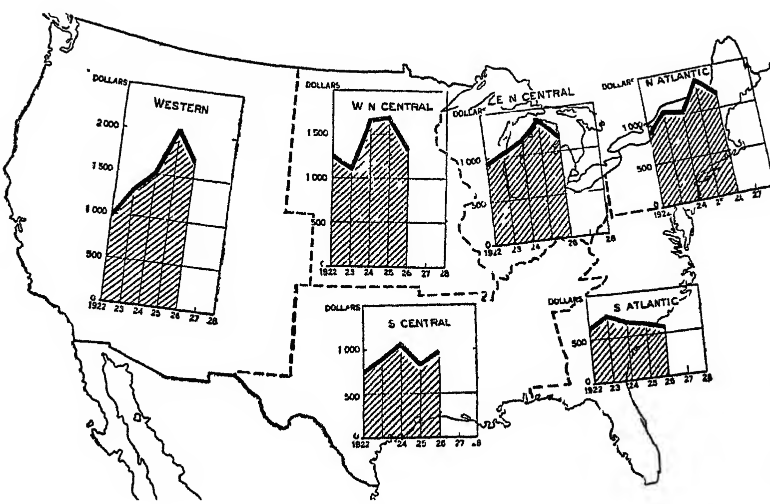

FIG. 125.—Trends of averages of farmers' reports. The values of the averages seem high only in comparison with those for the average of all farms, including tenants and croppers. The increase indicated in the South Central States for 1926 reflects the great improvement in the livestock and feed crop situation there. Cotton farmers had lower returns.

livestock production was the dominant interest, and to inventory increases of crops and livestock. The cotton farmers in this division, as well as in the South Atlantic division, had much lower returns than in 1925.

S. W. MENDUM.

INSECTICIDE Studies Develop Many New Ways to Kill Pests The use of insecticides is keeping pace with the growth and extension of agriculture. There is now hardly a crop subject to the attack of insects which is not treated in some fashion with chemicals to kill, repel, or restrict their depredations. In view of the large number of insect species involved, their different habits, and the varied crops upon which they feed, it is not surprising that insecticidal control measures are extremely diverse and that new situations are constantly demanding new or modified procedures.

The investigations of the Bureau of Entomology have been concerned with a large number of chemical compounds and mixtures. Efforts are constantly being made to extend the use of well known insecticides, to increase their effectiveness, and to discover new compounds or mixtures. The problem frequently demands the modifica-

tion of spraying, dusting, and fumigating machinery or the production of new insecticide appliances. The recent developments in these directions are summarized below.

In an effort to develop a cheaper and more efficient arsenical than lead arsenate, and particularly to remove the criticism against the presence upon fruits and vegetables of spray residues containing lead, an extensive series of field experiments with arsenical compounds was inaugurated during 1927. Some 13 arsenates and arsenites of copper, zinc, iron, manganese, aluminum, titanium, barium, and calcium were tested against a number of insects on fruit and truck crops at 11 field stations of the Bureau of Entomology, and at several State experiment stations in cooperation with their entomologists. Although the results confirmed the generally high effectiveness of lead arsenate, several arsenicals which do not contain lead showed promise and will be studied further. Very satisfactory results in the control of the Japanese beetle have been obtained with lead arsenate the particles of which have been coated with lead oleate. When applied as a spray, this mixture spreads evenly upon the foliage and adheres so firmly that it is only slightly affected by rains. It has also been found that the larvae of the Japanese beetle may be controlled by mixing lead arsenate with the soil in which they are living. Recently a successful method has been developed to control the Mormon cricket by means of sodium arsenite dust.

Investigations in the use of airplanes for insect control have reached a point where the method may be recommended for the treatment with calcium arsenate of large areas of cotton infested by the cotton-boll weevil. The larvae of malaria mosquitoes are surface feeders and will readily swallow particles of Paris green which float upon the surface of the water in which they are living. Experiments in the use of the airplane to distribute Paris green mixed with a cheap diluent such as lime, kaolin, or road dust have demonstrated that it is possible to kill malaria-mosquito larvæ in extensive swamp areas which could not otherwise be easily reached.

Action of Arsenicals on Insects

Studies on practical control methods with arsenicals have been supplemented with physiological investigations to obtain a more intimate knowledge of the action of arsenic and of arsenical compounds upon insects. It has been found that arsenic depresses both the oxygen intake and the carbon dioxide output of insects and that arsenites are more effective than arsenates in this respect. In addition, the toxicity of lead arsenate is being compared in the laboratory with that of a large number of organic compounds, under conditions which will provide accurate information upon the minimum quantity of poison necessary to kill an insect and the time required to kill.

Since their introduction as substitutes for arsenicals several years ago, the fluosilicates have been tested for the control of many of the major crop pests with which the Bureau of Entomology has been concerned. As insecticides for the Japanese beetle, the fluosilicates of barium, potassium, and sodium were found to be approximately equal in toxicity to lead arsenate whereas the fluosilicates of strontium, zinc, and calcium were moderately toxic and those of cadmium, aluminum, and copper showed little toxicity. Barium fluosilicate which has been coated with lead oleate was less injurious to foliage than the

untreated compound and was more toxic than lead arsenate to the Japanese beetle In experiments upon the codling moth the fluosilicates of barium and sodium have not been so efficient as lead arsenate. The results of a large series of field experiments on the Mexican bean beetle show that fair to excellent control is obtained when sodium fluosilicate, properly diluted with hydrated lime, is applied as a dust

A large number of organic compounds are being examined for effectiveness as stomach poisons. Certain nonarsenical compounds adsorbed on clay and other inert carriers have given promise as poisons for leaf-eating insects, and further experiments with them are in progress. Thallium sulphate, a recent introduction to the list of insecticides, has produced excellent results, in preliminary experiments, in baits for house ants.

Study of Calcium Cyanide

An intensive study has been made of calcium cyanide as a fumigant for insects attacking greenhouse plants. The dosages which will control the major greenhouse insects have been determined and the limits of temperature and humidity within which plant injury will not occur have been ascertained. The results have definitely established the value of calcium cyanide as a greenhouse fumigant and it is rapidly becoming a standard insecticide under these conditions. The possibility of using calcium cyanide for the control of citrus fruit insects in Florida is also under investigation, and it has given promising results in fumigation tests for the bulb fly. Experiments indicate that it is an effective fumigant for various types of commercial establishments.

The treatment of soil infested with larvæ of the Japanese beetle by means of an emulsion of carbon disulphide has been extensively investigated and practical methods for its application have been published. The treatment is particularly adapted for the destruction of the larvæ in lawns and golf greens. Carbon disulphide has also been successfully used to fumigate balled nursery stock.

A new fumigating mixture, ethylene dichloride-carbon tetrachloride, which consists of 3 volumes of ethylene dichloride and 1 volume of carbon tetrachloride, has recently been developed in cooperation with the Bureau of Chemistry and Soils to meet the need for a cheap, noninflammable, nonexplosive insecticide for insects attacking grain and other stored products. It is about five times as toxic to insects as carbon tetrachloride but is not dangerous to human beings. A large number of other aliphatic compounds were studied in this investigation and reports have been made upon several other effective mixtures.

An innovation in the paradichlorobenzene treatment against the peach tree borer has been its application dissolved in gasoline. Preliminary tests indicate that the solution is very effective and that with its use there is a saving in labor as compared with the older method, which involves the use of crystalline paradichlorobenzene.

Crude orthodichlorobenzene, because of its toxicity to insects and its marked ability to penetrate dry wood, has been found to be a valuable chemical to kill powder-post beetles in lumber used in interior woodwork. Thorough application of the material to the surfaces of the wood is usually sufficient to kill the beetles.

Because of the need of a cheap and effective contact insecticide for aphids and other small insects a study has been made in cooperation with the Bureau of Chemistry and Soils of a large number of compounds in the pyridine and pyrrole series. The purpose has been twofold: (1) To discover compounds which can be used in practical spraying and dusting operations, and (2) to obtain information upon the toxic action of these compounds which will form the basis for the synthesis of other organic insecticides. The results thus far have been encouraging, two compounds, derivatives of pyridine, having been found which show marked toxicity to aphids.

Tests with nicotine dusts for the control of truck-crop insects are in progress and effective dust formulas have been developed. Recently it has been found that commercial sodium carbonate is effective as a liberator of the nicotine in these dust mixtures. A system of spot dusting and spraying with nicotine has been developed for the control of the citrus aphid in Florida. Nicotine dusts have also given good results in the control of cattle grubs. A study of the physiological action of nicotine upon insects is in progress with the view to extending its use as an insecticide and furnishing information which may be applied to the synthesis of other organic insecticides of similar chemical structure.

The use of petroleum-oil emulsions, particularly those made from lubricating oils, as contact insecticides for the San Jose scale, camphor scale, and citrus insects, is being investigated. Special attention has been given to the toxicity of various oil fractions, to various types of emulsifiers, and to the factors which influence the action of the oil on insect and plant under field conditions. Studies have been made in cooperation with the Bureau of Chemistry and Soils on the relation of the size of oil drops in emulsions to insecticidal effect. Several emulsion formulas resulting from petroleum-oil investigations have been widely adopted in spraying practice. The effects of oil sprays on scale insects affecting coniferous nursey stock have been studied in cooperation with the Forest Service and a practical method of control devised

The Higher Fatty Acids

The discovery that the higher fatty acids possess marked toxicity to insects is a recent outcome of the bureau's work on insecticides. Emulsions of coconut fatty acids have given promising results as contact sprays and further investigations with them will be made.

A spray mixture containing extracts of pyrethrum has been developed as a contact insecticide for the Japanese beetle and has shown promise in preliminary tests against the Mexican bean beetle and bean leaf hopper. An investigation of kerosene-pyrethrum preparations for the control of house flies in barns and of flies on livestock is also under way.

Derris, a comparatively new insecticide of plant origin, has given excellent results in the control of cattle grubs and of fleas on domestic animals. Tests have demonstrated that Derris extract is very effective against leaf hoppers on leatherleaf ferns in Florida.

A large number of compounds and mixtures have been used in the treatment of wounds on livestock which have become infested with larvae of the screw-worm fly. The results of these tests indicate that benzene is an efficient larvicide for the treatment of infested wounds

and that it has a styptic action upon the wound which renders the latter less attractive to the adult fly. Of a large series of compounds and mixtures used to repel the adult screw-worm fly from wounds, pine-tar oil proved to be the best from the standpoints of cheapness, nontoxicity to livestock, and adhesiveness.

C. H. RICHARDSON.

INSURANCE of Crops Against Severe Loss Thought Practicable Two distinct dangers or hazards confront the producers of every important farm crop. One of these is a production hazard or the danger of serious damage to the crop during the growing or maturing stages. The other is the marketing hazard or danger of oversupply of the crop, with resulting gluts in the market and inadequate price.

The marketing hazard, or the surplus problem as it is often called, affects the entire group of farmers producing a given kind of crop. It can be dealt with only by concerted action of all or a substantial part of such group.

The danger of crop damage, on the other hand, is more largely an individual problem. The most important causes of such damage are drought, excessive moisture, floods, frost, hail, excessive heat, deficient heat, plant disease, and insect pests. These climatic and other hazards are largely beyond the control of either the individual or the group engaged in the production of a given crop. The total yield or volume of such crop varies materially from year to year, but this volume is, after all, relatively constant compared with the yield on a given farm. The latter may vary from a bumper crop to a total failure. The returns to the individual farmer from his capital and labor investment in the crop are unavoidably at the mercy of nature. For such a condition, insurance would seem to be the proper remedy. Only against hail, which accounts for about three per cent of the annual crop damage, is insurance now generally available. For a brief history of hail insurance in the United States, see Department of Agriculture Bulletin 912.

Experiments in Crop Insurance

Two attempts by certain insurance companies have been made to provide more complete insurance against crop damage. In 1917 three companies offered such insurance in the two Dakotas and Montana. In 1920 and, to a very limited extent, in 1921 two other companies made efforts to develop this field of insurance on a nation-wide basis. In each case, however, the results proved highly discouraging to the companies concerned. A severe drought in the limited area covered, coupled with carelessness in permitting insurance to be placed after crops were already doomed, accounted for the 1917 results. The sudden drop in agricultural prices in 1920, under a contract covering price as well as yield, made the outcome of the 1920 venture even worse than that of 1917. For a fuller summary of these crop-insurance experiments see Department of Agriculture Bulletin 1043. These experiments, although unfortunate, by no means prove the impracticability of general crop insurance. Since 1921, crop insurance other than against hail has been almost entirely limited to fruit and truck crops in selected areas.

In general, the crop producers at present have no opportunity, except as to the hail hazard, to protect themselves against the risks to which their crops are exposed. Every year, even when prices are satisfactory, large numbers of farmers are economically ruined, or are seriously crippled in their production programs for want of insurance against damage to their crops. Other industrial groups are offered insurance against almost every conceivable source of loss to their plants, equipment, and products. But, with the minor exceptions noted, the crop producer has hitherto been obliged, whether he chooses or not, to carry unaided by insurance the variety of risks or hazards to which his crops are exposed. The seriousness of these to the individual can be lessened but not removed by diversification, and a wide diversification is by no means always practicable.

The Farmer's Responsibility

The reason for this lack of protection may lie in part with the farmers themselves, in that they, in many cases, either underestimate the hazards to their crops or prefer to take chances rather than pay the necessary cost of protection. Most farmers have become convinced of the need for fire and windstorm insurance on their buildings, even though the chances of loss during any one year is on the average less than 1 in 400. Yet frequently if no serious crop damage has been suffered in the last three to five years, it seems to be assumed that the danger of crop loss is negligible. The contention of certain insurance men that farmers will not readily buy insurance on their crops is undoubtedly correct.

What the Farmer Really Needs

What the farmer really needs in the way of crop insurance is protection against serious crop damage from any and all hazards beyond his control. It would, no doubt, be impracticable, as well as economically undesirable, to insure a full or normal yield, since this would in certain cases invite a bad moral hazard. Two-thirds, or at most three-fourths, of a normal yield for the farm in question is perhaps all that can wisely be insured. Minor cases of crop damage can be borne by the farmer himself and must be so borne if insurance against serious losses is to be available at a moderate cost. To insure against minor losses that can without serious inconvenience be borne unaided, is a form of extravagance, since the collective cost will necessarily exceed the collective indemnities by the amount necessary to operate the insurance company or the department involved.

The present hail-insurance policy is defective in two particulars: (1) It covers only one out of several hazards against which the crop producers need protection. (2) Against this one hazard it gives a degree of protection not actually needed by the farmers and is therefore unduly costly. A considerable part of the annual hail premiums, which in recent years have averaged about $18,000,000, are used to indemnify for hail damage involving a 5 to 25 per cent loss, when the remaining crop may in a large percentage of the cases represent practically a normal yield. If indemnity were limited to cases where hail had brought the crop materially below a normal yield, the cost of such insurance could be greatly reduced. The

North Dakota State Hail Insurance Department pays hail losses only when they equal or exceed 10 per cent of the crop. Private companies, as a rule, pay hail losses whenever they exceed 5 per cent. Of the 697,276 acres on which hail losses were paid by the North Dakota department in 1926, 446,375 acres, or 64 per cent of the total number of acres involved, were damaged only 10 to 25 per cent.

Cost Need Not Be Prohibitive

Similar figures for private insurance companies or for other State hail departments are not available, and the North Dakota report does not indicate the percentage of total indemnities that were paid for these less severe losses. It is probable, however, that if all losses below 20 or 25 per cent were borne by the individual, the cost of protection against more severe losses could be reduced to approximately one-half of the present rate. In fact, there is reason to believe that in many States at least insurance against all climatic and other unavoidable hazards, covering about two-thirds of a normal yield, could be written at rates only moderately higher than the present commercial rates for hail insurance alone.

Until such insurance is available for farmers, they will be obliged to carry individually risks which relatively few among them are in position wisely to bear. Will farmers safeguard themselves by insurance if given a fair opportunity? Indications are that many will do so, but that considerable effort on the part of leaders in agricultural thought will be necessary to stimulate a general demand for sound and conservative protection, at equitable rates, in which indemnities are limited to severe cases of crop damage, without any more frequent minor indemnities such as are at present expected and paid. If such a demand is developed, means for meeting it will no doubt be found. To hold otherwise would seem to be an indictment against American business enterprise.

V. N. VALGREN.

IRRIGATION Farming Often Turns on Ways of Applying Water

The economic and financial vicissitudes of a number of irrigation enterprises in the United States have been such as to raise the question as to whether this type of farming is more than a doubtful experiment. Prior to the middle of the last century our pioneer farmers had not attempted to use irrigation as a means of crop production. Since that time rapid progress has been made, until it is now estimated that there is an area of about 20,000,000 acres under irrigation in the continental United States.

It is unfortunately true that not all of the area classed as irrigated land has been found to be productive. In some cases it was unproductive from the first. In irrigated areas as elsewhere there is great diversity in the fertility of the soil, and these differences are not always apparent to the inexperienced. There are many areas in the humid section of this country where attempts to grow crops have not been successful because of the low productivity of the soil. The view is frequently expressed that the fertility of the soil has been exhausted by this or that type of farming and that the abandonment of farm lands in certain sections of the country has been chiefly due

to this exhaustion of fertility. As a matter of fact, there is very little sound evidence to support this belief. In the great majority of cases the so-called worn-out soils never were productive. If their use for farming is discontinued it is due either to the discovery of that fact or to changing economic conditions in which the competition with soils naturally more fertile has been an important factor. On the other hand, lands under humid conditions that were naturally fertile when first broken by the plow have continued to be so for many generations.

Situation in Irrigated Lands

With irrigated lands the situation is somewhat different. Not only are there areas of idle or abandoned land that were unproductive from the first, but there are other areas where good crops were once produced but where now little of value can be grown. The reason for the changed condition is sometimes obvious, but in other cases it is not. For example, if local conditions are such that irrigation water accumulates in the subsoil until the soil of the root zone is saturated or until the surface soil is submerged by a process known as water-logging, the cause of unproductivity is manifest. Such events are not uncommon on irrigated land and may involve areas that were naturally very productive.

Another adverse condition that may develop in irrigated land comes about through the accumulation of soluble salts in the root zone. The waters available for irrigation in an arid region usually contain appreciable quantities of dissolved salts. The quantity and character of these salts vary greatly with different streams. The water that is applied to the soil by irrigation is largely evaporated into the air either directly from the soil or from the leaves of plants. The salt does not evaporate with the water, and very little of it is absorbed by the plants. It remains in the soil, where its quantity is increased with each successive irrigation Thus when the quantity of water used for irrigation is not more than enough to supply the needs of the crop plants, the salt that it brings to the soil accumulates there and adds to the concentration of the soil solution.

As the soil solution becomes more concentrated, chemical reactions take place between the salts in solution and the solid material of the soil. By these reactions, which are known as base exchange, the physical properties of the soil may be profoundly modified. For example, if a soil that is naturally friable and that absorbs water readily is treated with a solution containing sodium salts, the reactions of base exchange result in reducing its friability and its rate of water absorption. These changes in the physical condition of the soil are not manifested until after the salt solution is removed from the soil, as by replacing it with a less dilute solution. They become most evident after an attempt is made to reclaim salty soils by drainage and leaching. Were it not for these injurious effects of salt on the physical condition of the soil, the salt problem in irrigation would be much less serious than it is.

Chief Menaces to Irrigated Farming

The three conditions just described—water-logging, salinity, and impermeability—which may occur separately or in combination on irrigated land, constitute probably the chief menace to the perma-

nence of irrigation agriculture, in so far as such permanence depends upon the sustained productivity of the soil. Not all of the vicissitudes of irrigation enterprises can be traced to these causes. Other physical factors as well as economic conditions have to be taken into account. Nor should it be inferred that because these conditions are inherent in and peculiar to irrigation farming they are universal and inescapable. As a matter of fact, some of the oldest agriculture known to history has depended upon irrigation, as in Egypt and westward through northern Africa as well as in southwestern China. On the other hand, there are regions in southwestern Asia, as in Mesopotamia and northward, now alkaline desert wastes, where formerly there were prosperous communities supported by irrigation.

A review of irrigation in the United States covering a period of 75 years shows many examples of conspicuous and enduring success as well as some instances where partial or complete failure may be properly charged to declining productivity of the soil. In these cases of disappointment or failure it is essential to have a correct understanding of the causes in order to consider measures of prevention or remedy. It can not be questioned that many failures in farming under irrigation, as elsewhere, have been due to attempts to use land that was naturally unproductive. Mistakes of that sort are properly chargeable to ignorance or inexperience rather than to the inherent limitations of a system of farming. In the present connection the focus of interest is on those situations where the land was at first highly productive but has undergone a marked change as a result of irrigation. Unless the causes of such deterioration are made a matter of common knowledge, there is grave danger that there may develop a widespread lack of confidence in the economic stability of irrigation farming.

Capital Costs High

The capital costs of irrigation farming are relatively high because of the necessity of constructing expensive engineering works before the land can be used. If this capital is to be obtained on favorable terms, there must be a general feeling of confidence that the investment is sound. Furthermore, the task of establishing a farm as a going concern is one that requires time, usually many years. Unless there is a reasonable assurance that, once established, it will be productive for a long time, it is not likely to be developed. This is no less true for the community or group of farms than for the individual farm. The credit requirements of irrigation farming are such that not infrequently the irrigation farmer finds himself paying out of his gross receipts a larger sum annually as interest on borrowed capital or hire of money than he pays for the hire of labor. The rate that he must pay for the hire of capital is very greatly influenced by the degree of confidence that is felt by the lender in the permanence or continuity of the farming business, and this in turn rests very largely on the question as to the sustained productivity of the land.

There appears to be abundant evidence, gathered from the field of practical experience and from the results of numerous technical investigations, to support the view that the deterioration of the productivity of irrigated land is preventable. In other words, there is no reason for believing that irrigation agriculture is necessarily any less permanent than agriculture supported by rainfall. The impairment of the soil, whether it is caused by water-logging or salinity,

can be prevented by the adoption of a suitable system of irrigation. But a correct understanding of the cause must precede and guide the adoption of the preventive measures. For example, when it becomes apparent that there is taking place an accumulation of water in the subsoil of irrigated land, it is not sufficient to assume that this is due to the excessive use of irrigation water and that artificial drainage is the only method of preventing serious injury. An investigation of conditions may show that the excess subsoil water comes from seepage from canals and not from percolation through the root zone of the irrigated fields. Where this proves to be the case, no useful purpose is served by restricting the application of irrigation water to the possible detriment of the crops and of the soil, and it may be found that it is cheaper to prevent excessive canal losses than to construct a drainage system.

Salinity and Waterlogging

The problem of salinity in irrigated land may or may not be associated with waterlogging. It is more commonly related to the quality of the irrigation water. If that water contains appreciable quantities of salts of high solubility, such as the salts of sodium, a faulty system of irrigation is almost certain to result in disaster. Where salty water is used for irrigation it is not safe to use it sparingly. The salt that is brought in by the irrigation water must not be permitted to remain and accumulate in the root zone. The only known way of preventing such accumulation is to use enough water to leach the root zone from time to time. The more salt there is in the irrigation water the more frequently is it necessary to leach the soil. If the subsoil conditions below the root zone are not such as to provide for the removal of these soil leachings through natural outlets, then it becomes necessary to construct artificial drainage outlets.

The history of irrigation in the Old World shows that while some regions that were once prosperous have been abandoned, there are many other sections in which intensive irrigation farming has been practiced since the earliest period. Where failures occurred there is often uncertainty as to the chief cause. This may have been a lack of drainage or the accumulation of salt in the soil, or it may have been due to economic causes. In our own country we have numerous instances where successful irrigation has been continued for several generations with no evident prospect of decline. Where failures have occurred or seem to be imminent, the causes appear to lie in faulty methods of applying the water, in which improvements may be expected to follow a better understanding of the essential factors involved.

Carl S. Scofield.

JAPANESE BEETLE in 10 Years Invaded 13,919 Square Miles

The fall of 1926 brought to a close the first decade since the Japanese beetle was discovered in the United States. During this period the insect multiplied, caused severe losses through its attacks to the foliage of various kinds of plants, and increased the area of its distribution in a truly remarkable manner. The question of how serious a pest the Japanese beetle

may become is frequently asked, and it is extremely difficult to give a definite answer. Many facts, however, have been learned about the insect, its habits, and its susceptibility to control measures, and it seems timely to discuss briefly its present economic status.

At the close of the season of 1926 the insect was known to occur over an area of approximately 13,919 square miles. This included the entire State of New Jersey and portions of Connecticut, New York, Pennsylvania, and Delaware. Scouting in the summer of 1927 resulted in the finding of adult Japanese beetles at a number of points outside of the known infested area. A number of beetles were found at several points in Washington, D. C. Small infestations were located in Baltimore and on the Eastern Shore at Cambridge and Ridgely, Md. General infestations were found in Gettysburg, Sunbury, and Milton, Pa., while a few beetles were discovered in a number of coal-mining towns in the central part of the State. They were not found west of Wilkes-Barre, Pa. Very little increase in the distribution of the beetle was noted in the northern portion of the area. A few beetles were collected at Nyack, N. Y., although none were found outside of the area under quarantine in Westchester County. A general infestation was found in Bridgeport, Conn

The distribution of the beetle is determined by employing large numbers of men each year for scouting during the summer when the adult insect is present. During the season of 1927 scouting was conducted southward to Virginia, westward to Pittsburgh, Pa., and Buffalo, N. Y., and northward into the New England States.

Losses to Crops in 1927

While the Japanese beetle is known to occur over a large territory, the area where the beetles are sufficiently abundant to cause serious injuries to crop plants is relatively small and comprises not over 700 square miles in eastern Pennsylvania and central New Jersey. The most serious injuries have been noted in Burlington, Camden, and Gloucester Counties, N. J., and Philadelphia, Montgomery, and Bucks Counties, Pa. Slight injuries to plants were noted along the Delaware River in Newcastle County, Del. At the present time the Japanese beetle is causing its most serious damage to the fruit and foliage of early-ripening varieties of apples and peaches. (Figs. 126 and 127.) Its injuries are also serious on grapes, plums, cherries, blackberries, raspberries, corn, beans, beets, and carrots. The feeding by the adult beetles on ripening blackberries and raspberries is apparently increasing each year.

During the season of 1927 the injuries to both sweet and field corn were more extensive than in any previous season. The adult beetle feeds on the newly formed silk as it protrudes beyond the husk (fig. 128) and in many instances prevents the pollination of the ear. The most extensive injury of this type was caused to the second and third plantings of corn in eastern Pennsylvania. In some cases the beetles feed on the small kernels of corn under the husk, producing an injury similar to that caused by the corn-ear worm.

In addition to injuries to food crops, the beetle has caused damage to shade trees and ornamental plants by the destruction of both the foliage and the blossoms, and the larvae may destroy the sod in lawns, golf courses, and pastures when their number exceeds approximately 100 to the square yard.

FIG. 126—Apples injured by the Japanese beetle

FIG. 127.—Japanese beetles feeding on the fruit and foliage of peach

Preventing Injury to Foliage

Of the trees, the elms, lindens, horse-chestnuts, Japanese maples, beeches, birches, and poplars all lose considerable of their foliage through the feeding of the beetles each summer in the heavily infested area. By timely spraying, however, the foliage injury can be almost entirely prevented. Data have been obtained relative to the effect of continued defoliation of several types of plants. It has been observed that willows and Lombardy poplars may be killed after three or four years' continued defoliation by the Japanese beetle. Other types of trees are apparently weakened and may become subject to the attacks of other insects and of plant diseases.

Among flowering plants, roses, hollyhocks, dahlias, and cannas are probably the most severely injured.

FIG. 128.—Adult Japanese beetles feeding on corn silk Cutting of the silk in this manner may prevent pollination

The area in which the beetles are most abundant in New Jersey is devoted to the growing of truck crops and fruit. As a result there is a wide range of plants upon which the beetles may feed. (Fig. 129.) In the northern portion of Philadelphia County, Pa., however, the conditions are suburban, with less orchard fruit, more truck, and considerably more corn grown in proportion to other crops. It was apparent during the season of 1927 that the beetle injury to both field and sweet corn was more severe in the Pennsylvania area than it was in New Jersey. This indicates that when the Japanese beetle becomes established in large numbers in areas where a smaller variety of crops is grown, the losses may tend to increase in proportion to the extent to which the particular crops grown are subject to attack.

Measures of Control

The problem of control on early ripening varieties of peaches, small fruits, corn, and flowering plants upon which the beetles may feed has not been finally worked out, and every effort is being made to improve the existing control measures for these crops. Excellent protection is obtained, however, on apples, cherries, grapes, and various shade trees and ornamental plants through spraying with lead arsenate. The sprays must be applied at the proper time and with absolute thoroughness in order to obtain the most satisfactory results. For nonbearing fruit trees and ornamental plants a specially prepared lead arsenate is recommended. This is known commercially as coated lead arsenate and contains an admixture of lead oleate which serves to spread and stick the particles of poison to the foliage.

Fig. 129.—Injuries to the foliage of soy beans caused by the Japanese beetle

It has been found that acid lead arsenate is a partial repellent, although investigation has shown that approximately 30 per cent of the beetles which come to the sprayed plants consume a killing dose of the poison. In the case of the coated lead arsenate, between 80 and 90 per cent of all beetles coming to the sprayed foliage are killed. A spray consisting of an extract of pyrethrum combined with a soap has been developed for the purpose of killing the Japanese beetle on contact. This material was in rather general use by the public during the summer of 1927, and the results obtained were satisfactory.

The development of an attractive agent known as geraniol has led to the use of traps for catching and destroying the beetles. These traps are now on the market and are capable of catching from 1 to 3 or 4 quarts of beetles each day. The traps are simple in construction and are baited with a mixture of bran and geraniol. One charge of bait is sufficient for the season if proper care is taken of the trap.

Means have been developed for the control of the larvae of the Japanese beetle in lawns, golf courses, and other locations where fine turf is grown. These consist either of treating the sod with a very dilute emulsion of carbon disulphide or of applying lead arsenate to the soil at the rate of 1,500 pounds of the powder to the acre.

The experience of several years has shown that where the Japanese beetles are very abundant the problem of control is extremely difficult, if followed by only a few individuals in each community. Several suburban towns in New Jersey have undertaken community control of the beetle. The shade trees and ornamental plants and fruit trees throughout the towns have been sprayed, and the cost of such spraying charged to the owners. The success attending this work has resulted in the undertaking through the several communities of a State-wide campaign of Japanese beetle suppression.

In addition to developing the various sprays and chemical treatments which have been tried for the control of the Japanese beetle, the Department of Agriculture is introducing into this country the insects which are parasitic on the beetle in its native home. These efforts have been attended thus far by marked success, and at the present time five species of parasites of the Japanese beetle are established in New Jersey and Pennsylvania. Several of these have been established for several years and are becoming abundant in certain localities.

The General Situation

In reviewing the general situation with respect to the Japanese beetle, it is thought probable that the insect will continue to spread through both natural and artificial means. It is believed that the local spread can be greatly retarded and long-distance spread prevented through the enforcement of quarantines restricting the movement of those articles on which the beetle is likely to be carried.

If the beetle were allowed to go unchecked, the injuries which it might cause to economic plants would probably constitute a real obstacle to the production of certain crops. It has been shown, however, to be susceptible to control by chemicals, and the measures employed in New Jersey at the present time are giving satisfaction to those who are using them.

The situation in New Jersey and Pennsylvania, with certain exceptions, indicates an urgent need for the dissemination of more detailed information on the use of the methods of control which have already been devised.

The decided success which has thus far attended the introduction and establishment of several parasites is a most hopeful sign. This phase of the work is being enlarged as rapidly as the conditions warrant and no effort is being spared to develop as rapidly as possible this biological means which ultimately may be of great assistance in the control of the Japanese beetle.

LOREN B. SMITH.

JAPANESE BEETLE Now Faces Attack by Five Imported Parasites

The most destructive insect pests of our agriculture are known to be of foreign origin, having been introduced into this country accidentally on or within various plants and plant products which have been imported from foreign lands. These insects cause great damage, largely because they have increased to vast numbers, and this increase is due in part to the lack of special insect enemies which would otherwise hold them in check. Our native insects have many such enemies which keep them in subjugation, and although these parasites

sometimes transfer their attack to introduced insects, this is rather exceptional. Thus, in the case of the Japanese beetle we have a foreign insect which was accidentally introduced into this country apparently free from all of its true parasites. It has multiplied almost without check, and has now become one of the most serious pests in the eastern part of the United States.

In Japan we find the so-called Japanese beetle, *Popillia japonica*, to be common but rarely occurring in sufficient numbers to cause serious damage to crops. We also find that there are there several true parasites of this beetle, and that these are most effective in checking its rapid increase. The logical thing to do in our own country, therefore, is to build up a natural balance similar to that existing in Japan. This is exactly what the Bureau of Entomology has undertaken as one of the control measures against the Japanese beetle.

In 1920 work on the insect enemies of this beetle was instituted in Japan, where research revealed that it had five common parasites. Later, in 1922, investigations were begun in Chosen (Korea). It was found that the true Japanese beetle was not present in that country, but that several very closely allied forms existed there, and that they had parasitic enemies which could easily be made to transfer their attacks to the Japanese beetle. This discovery greatly increased the possibility of control in the United States, by adding to the number of possible parasites. As species closely allied to the Japanese beetle were known to occur in China and India, work was extended to include those countries. Since this expansion has taken place, shipments of parasites have been received from all of the countries mentioned.

The Introduced Parasites

The parasites which have been introduced are members of two groups of insects, namely, parasitic flies of the family Tachinidae and parasitic wasps of the family Tiphiidae. Out of 12 or more possible parasites which will attack the Japanese beetle, 5 species have been established up to the present time (1927). Of these, 3 species are flies and 2 are wasps. The flies are particularly interesting because of their strange life cycles, and are worthy of individual mention.

FIG. 130.—Centeter fly, a parasite of the Japanese beetle. 3

The first fly to be introduced was *Centeter cinerea*. (Fig. 130.) It is about as large as the common house fly and resembles it superficially. Centeter is a parasite of the adult beetle. It lays its eggs on the thorax of the beetle just behind the head. Here the eggs are very conspicuous (fig. 131) and thus aid materially when observations are being made on the natural spread and establishment of the parasite. The eggs hatch in from 36 to 48 hours after deposition. The young larva, or maggot, drills directly downward through its eggshell and through the thorax of the beetle, whose body it enters without at any time exposing itself externally. The larva develops rapidly. At first it feeds in the thorax of the host but finally migrates to the abdomen. The death of the beetle occurs from

five to seven days after the egg is laid. One female fly has been known to produce as many as 62 eggs. Just prior to death the beetle buries itself in the soil. The Centeter maggot then kills it, and about two to four days later it forms its puparium, in which it passes the winter. There is only one brood of flies each year.

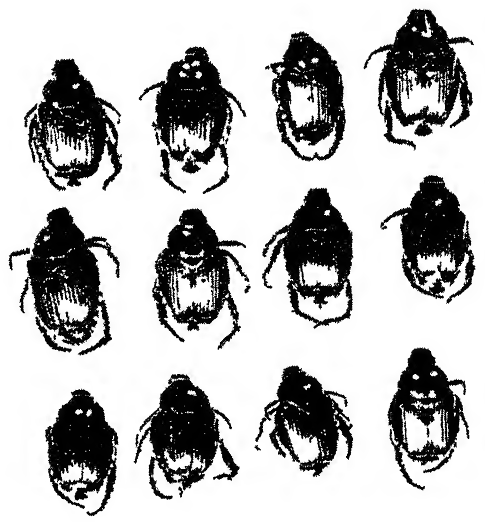

FIG 131 —Eggs of Centeter fly on Japanese beetles × 1½

The Centeter fly was first established in New Jersey in 1923, and it has spread rapidly but thinly over an area of approximately 75 square miles. Several years more will be necessary before its importance can be definitely determined. In the central part of the area parasitism runs as high as 10 per cent at the beginning of the beetle season, although dropping very rapidly as the season advances. In northern Japan, where it is normally found, it parasitizes from 40 to 80 per cent of the Japanese beetles in certain districts.

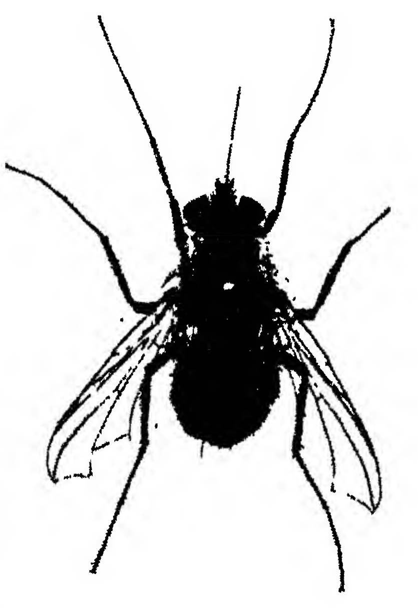

FIG. 132 —Prosena fly, a parasite of the Japanese beetle grub × 3

Parasite Important in Japan

Prosena siberita (fig. 132), the second fly to be introduced, is of considerable importance in Japan, where it parasitizes about 10 per cent of the grubs. This fly does not deposit eggs, but produces 800 to 1,000 or more living maggots, which are laid on the surface of the soil in grub-infested areas. The newly deposited maggot enters the soil and burrows around in search of beetle grubs. Upon coming in contact with one, the maggot bores directly into it through the body wall, and finally becomes attached to the breathing tubes of the host, from which it obtains its air supply. Its growth is arrested in the fall of the year after its first molt, and is not completed until early summer. At this time the maggot grows rapidly, and develops at the expense of

its host, which it soon kills. (Fig. 133.) Its period of pupation, or resting stage, lasts about 22 days; then it changes to a fly. There is only one generation a year, and the adult flies occur during July and early August.

Although numerous attempts had been made to establish the Prosena fly there was no evidence of success until a fertile female was taken in the field in July, 1927. The recovery, later in the season, of puparia from beetle larvae gave further evidence of its establishment. The liberations of imported material will be continued, however.

FIG. 133.—Prosena fly maggot emerging from Japanese beetle grub × 2

The Korean fly *Dexia ventralis* (fig. 134) was first found by the writer in Chosen (Korea) in May, 1922. In general, its life history is somewhat like that of the Prosena fly, except that Dexia has three generations a year in its native land and parasitizes several species of beetles. These differences in its habits have caused considerable conjecture as to whether it could be established in America, and whether, if established, it would be of much value as a parasite of the Japanese beetle. The first liberation of this species was made at Haddonfield, N. J., in July, 1926, and consisted of 1,352 adult flies. Extensive scoutings were carried on during the following season to determine if the species had survived the winter. The first recovery, made on August 3, 1927, was followed by others. These recoveries lead the writer to believe that the species is now firmly established, and that in the future it will prove to be of great importance.

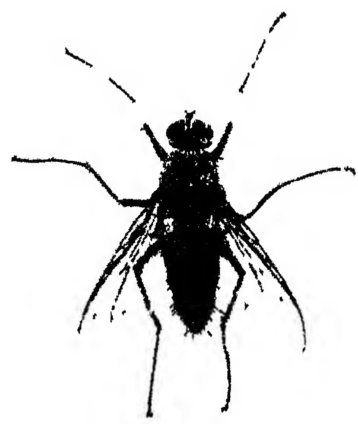

FIG. 134.—Dexia fly, a parasite of the Japanese beetle grub × 3

Habits of Parasitic Wasps

As the habits of the several tiphiid wasps which form the second group of parasites of the Japanese beetle are similar, it will be necessary to give only one life history as an example. In this group all the females deposit their eggs on the grubs of the beetle. The wasps are black and look much like winged ants of rather large size, being about one-half to three-fourths of an inch in length. (Fig. 135.) The female wasp spends much of her time in the soil, searching for beetle grubs. When she finds one she stings it, and during the temporary paralysis which ensues she deposits a single egg,

attaching it firmly to the body of the grub. When the grub recovers it begins to feed, and it continues to do so for some time after the egg of the parasite has hatched. Meanwhile the Tiphia larva feeds upon the vital fluids of its host and consumes it in about 15 to 20 days. (Fig. 136.) It then spins a silken cocoon in the soil and remains in it until the following season, when it transforms into a wasp, and the life cycle is thus started again. In Japan it was found that these wasps commonly parasitize about 10 to 15 per cent of the beetle grubs.

FIG. 135.—*Tiphia popilliavora*, a parasitic wasp which attacks the Japanese beetle grub. × 3

Two species of this group have been established here. One, *Tiphia popilliavora*, appears in late summer, while the other, *T. vernalis*, occurs in the spring. The former was found to be established during the summer of 1926, and has since spread, so that its range covers more than a square mile of territory, within which it is extremely abundant. It is estimated that this species effects a parasitism of at least 10 per cent in the vicinity of Riverton, N. J. From the mother colony 11 new colonies have been started, one of which is located at Westbury, N. Y., in the region infested with another introduced pest, the Asiatic beetle, *Anomala orientalis*. As *T. vernalis* was established only in the summer of 1927, it is still too early to report its progress.

FIG. 136.—Tiphia larva feeding on Japanese beetle grub. × 2

The problem of building up a natural balance is a difficult one. Much care must be taken to introduce only the true beneficial parasites of the insect to be controlled. The establishment of these is often very difficult because of their complicated life cycles and of the long distances which the parasites must be shipped. The effectiveness of any species can be determined only by actual introduction and trial.

J. L. KING.

JOHNSON Hay Market Unsatisfactory; Cure in Producers' Hands

Johnson grass is the principal hay crop of the black prairie belt of Alabama and Mississippi, and in many sections of this belt it occupies the land almost to the exclusion of other crops. It is also important—though less extensively produced—in the vicinity of Augusta, Ga., in several sections of Texas, and in a few other localities of the South. In those sections in which it occupies extensive acreages of land it may be regarded as a fixture, for the difficulty attending its eradication renders such land undesirable for the production of corn, cotton, or other intertilled crops. From an economic standpoint the production of market

hay appears to offer the most practical solution for the utilization of land that is already occupied by Johnson grass.

At the present time the market for Johnson hay is in an unsatisfactory condition. The shipping of quantities of low-grade hay has resulted in such a prejudice against the product that in some markets there is no demand for even the best quality of Johnson hay. Obviously this prejudice must be overcome before Johnson hay can hope to enjoy its rightful place in the market. The future of the Johnson-hay business is in the hands of the producers, and a healthy demand for the product can be revived only by keeping the weedy, trashy, and damaged hay off the market and by shipping only such quality of product as will meet the market demands.

Several methods of preparing Johnson hay for market are practiced. Producers are generally agreed that Johnson grass should be cut before it is fully headed out, but they differ widely in their practices in curing and baling. Some producers cure in the swath and windrow and bale direct from the windrow; others put the cured hay in cocks and bale after it has stood in the cock for several days; and others stack their hay and let it go through a sweat before baling. The most common are the windrow baling and the stacking methods; and producers are divided in opinion as to which of these methods is preferable. The question as to whether windrow baling or stacking is the better method depends largely on the season of the year, labor supply, and available storage room for baled hay.

The Stacking Method

The stacking method requires a greater total amount of labor but is generally preferable when the supply of labor is short at harvest time, or where ample storage room for the baled hay is not available. This method is more common on those farms where the production of hay is a minor enterprise, or of comparable importance with one or more other enterprises. Hay that is properly cured and put up in well-built stacks will remain in good condition for some time and, when baled, may be shipped with no danger of going out of condition while in transit. On the other hand, poorly stacked hay is likely to spoil and be unfit for market.

The windrow baling method is generally practiced by producers with whom hay is the principal enterprise and whose farms are organized and equipped to handle the crop in an efficient and expeditious manner. This method calls for an ample supply of labor at harvest time, and for adequate storage room for the baled hay. Hay of the best quality can be produced by this method, but only by the most careful attention to curing before baling and to the subsequent storing of the baled hay. Hay baled from the windrow should never be shipped immediately after baling, for it will heat in transit. The bales should be put in storage and stacked on ends or edges with air spaces between the bales to allow for the circulation of air, and should be restacked in the course of three or four days. If this practice is followed the hay will remain in good condition with little danger of heating. Windrow baled hay should remain in storage for at least 20 days before shipping.

M. A. Crosby.

LAMB Price Changes Usually Controlled by Very Few Factors From the time the first tender Easter lambs from California come on the market in early spring until the last fat lambs from the Corn Belt are cleaned up a year later there is always something doing on the lamb market. Prices change frequently. Knowing what lambs are selling for at one time does not go very far toward telling a farmer or a rancher what they may bring a short time later.

Statistical studies of lamb prices show, however, that the price of lambs is largely controlled by a few factors. Considering only average prices, these factors have accounted for 95 per cent of the price changes from month to month for the last 20 years. It seems reasonable to assume therefore that they will continue to be important factors in the lamb market.

The price of wool itself has an important bearing on lamb prices, especially during the winter and early spring when fed lambs carrying

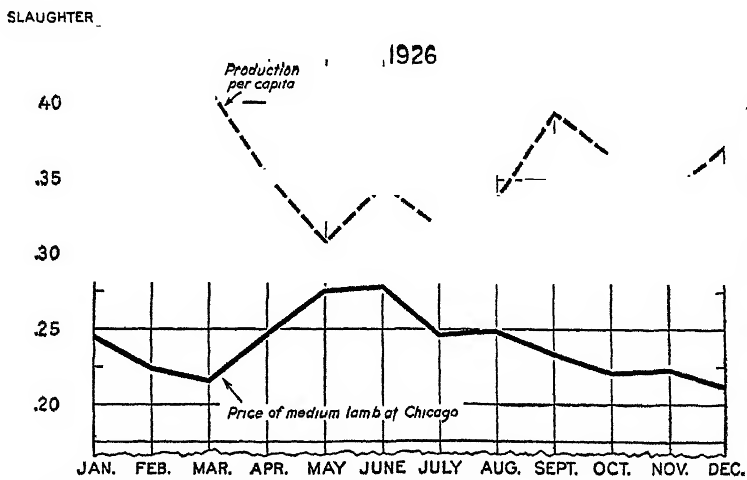

FIG. 137.—Lamb prices make marked response to differences in the quantity slaughtered

a heavy fleece are marketed. After the lambs begin to be shorn before marketing this factor loses its importance.

Where the lambs came from has but little effect on the price of the dressed carcass. Whether the lamb was born on the Texas plains and fattened on Colorado beet pulp, or whether he was born in the Idaho valleys, followed the springtime vegetation up the mountains as the summer advanced and then moved down the other side of the divide and on east to market as fall came on and the forest-grazing season ended, or even whether he lived a prosaic life on a Corn-Belt farm where he was lambed, weaned, and fattened, seems to make very little difference to consumers. Once the lambs are sold and slaughtered, they largely lose their identity; and the quantity and quality of meat to be sold largely determines the price which the carcasses will bring.

Figure 137 illustrates how markedly lamb prices respond to differences in the quantity slaughtered. In March, 1926, with 0.41 pound of lamb produced (under inspected slaughter) per capita of population, dressed lamb brought only 21 cents per pound at Chicago on

the average. During the following months slaughter decreased to between 0.31 and 0.34 pound per capita, and dressed-lamb prices advanced to around 27 cents. In the fall, with increasing slaughter, prices declined well below 25 cents again.

Statistical analysis shows that such changes in the supply of lamb from month to month cause, on the average, about two-thirds as much change in the price of dressed lamb—that is, if the quantity slaughtered increases 10 per cent, dressed-lamb prices usually go down about 6 per cent; whereas if the quantity decreases 20 per cent prices go up about 12 per cent. This relation holds true for changes in monthly lamb slaughter within the range from 0.3 to 0.6 of a pound of dressed lamb (produced under inspected slaughter) for each person in the United States.

Supply Not the Only Factor

Supply is not the only factor that causes changes in price. Thus, in June, 1926, slaughter increased, yet prices advanced. For one thing the consumer demand for lamb changes through the year; it is highest in June and lowest in December. About 15 per cent more dressed lamb can be sold in June than in December if wholesale prices are the same both months.

Other factors, such as the price of steers and of hogs, also have some influence on lamb prices, since lamb competes to a certain extent with these products for a place in the diet. These factors are relatively unimportant, however, compared with changes in lamb supply. The growth of population has a bearing on the demand for lamb, for the demand increases at almost exactly the same rate as population according to the statistical analysis.

Besides these specific factors, lamb prices are influenced by other factors such as the general prosperity of consumers and the purchasing power of money. Thus in 1920, when the general level of all prices was high because money was cheap, lambs were also high, even though the supply was large. The prosperity of consumers is reflected in lamb prices, 10 per cent reduction in business activity causing about 1 per cent reduction in lamb prices.

Same Factors Operative for Long Period

All of these factors taken together account for over 95 per cent of the changes in the average price from month to month. Since lamb prices are responsive to changes in supplies and other economic factors, the only way that ranchers and farmers can judge what changes are likely to take place in the lamb market is by studying the economic factors which determine lamb prices. Information on the lamb situation, such as the size of the lamb crop and the number of lambs on feed, which is being published from time to time, and the semiannual sheep outlook statements, both issued by the Bureau of Agricultural Economics, give the lamb producer a reliable indication of the future of the lamb market, and so help him to plan his operations on a rational basis.

MORDECAI EZEKIEL.

LAMB Prices Show Quality and Orderly Selling Necessary The live lamb markets in the United States are largely governed by conditions in the dressed-lamb trade in New York City. Almost one-third of the total United States inspected slaughter of sheep and lambs is consumed in the New York metropolitan district which requires about 10,000 lambs daily. This district demands high-grade lambs and discriminates sharply against those of inferior quality.

The Jersey City live-lamb market which is adjacent to New York City is one of the important market centers and as New York slaughterers patronize it extensively it quickly reflects any changes in the dressed-lamb trade. Jersey City is the principal outlet for lambs raised in Kentucky, Tennessee, Virginia, and other important native lamb-producing States. A few years ago these States marketed many inferior and low-grade lambs at Jersey City. When such supplies became excessive at that market, as often happened around the end of June and in early July, prices became demoralized and this in turn affected markets elsewhere. These erratic market conditions resulted in frequent losses to both shippers and slaughterers, consequently in 1922 the Department of Agriculture was requested to study the situation with a view to finding a remedy. The solution appeared to lie in developing a more orderly movement of lambs to market and in improving the quality of the product. This, however, could be effected only by getting lamb producers themselves to take action.

Improving the quality of the lambs necessitated using better rams, giving better care to the ewes before and after lambing, using the best preventives against parasitic infestation, docking all lambs and castrating ram lambs to be raised for market.

Educational Campaign Required

Getting the lamb producer to do these things necessitated an educational campaign by means of actual demonstrations and much publicity. The University of Kentucky had already started such a campaign and was getting such excellent results that Kentucky lambs were acquiring a national reputation for quality and were topping the market. West Virginia and Tennessee soon followed Kentucky's lead by placing lamb specialists in the field to work direct with producers. Tennessee "standardized lambs" soon acquired a reputation equal to that of the best Kentucky lambs and had the advantage of reaching the market a few weeks earlier. Virginia not to be outdone, also placed a specialist in the field to carry on lamb-improvement demonstrations and in cooperation with the Jersey City trade interests conducted purebred ram sales which enabled its producers to buy purebred rams at reasonable prices.

With the lamb-improvement work well under way in the early lamb-producing States it was only a short time until the effects were very noticeable at the Jersey City and New York markets. No longer is there the universal complaint about an oversupply of inferior lambs and demoralized markets. Some producers who are determined to follow old methods still raise inferior lambs but the great majority see the advantage of producing a high-quality product and are falling rapidly in line. With continued attention given

to the lamb-improvement work and a little more attention given to effecting an orderly movement of lambs to market, the widely fluctuating markets at Jersey City will soon be a memory of the past.

C. A. Burmeister.

LAMBS To-day Show Much Improvement Over Past Quality Forty years ago the housewife bought very little lamb because little was offered for sale. Most of the sheep slaughtered then were from 4 to 8 years of age and were mostly of merino or fine-wool breeds. Total wholesale slaughter at that time was less than half that of the present day even though flock numbers were probably as large or larger. Sheep were then raised almost wholly for their wool, whereas now they are kept primarily for raising market lambs.

Instead of buying heavy mutton of uncertain age and flavor which carries excessive fat, the modern housewife buys lamb chops and leg and breast of lamb, obtained from the tender carcasses of lambs ranging from 4 to 12 months of age. Lambs of this age now constitute at least 80 per cent of the market supply of all sheep. These market lambs come mostly from the mutton-type breeds or crosses between the wool and mutton types. When in good flesh condition these lambs yield meat that is considered a real luxury by meat connoisseurs.

Under the modern system of sheep raising the consumer is assured a steady supply of fresh lamb throughout the year even though 75 per cent of the annual lamb crop is born in March, April, and May. Lambs born in the late fall and early winter reach market in the early spring, but they represent only a small part of the market supply at that time. Some of these extremely early lambs are given special care and attention and are marketed as "hothouse" lambs.

Spring Lambs Marketed May and June

The bulk of the so-called spring lambs, those marketed direct from their mothers, reach market during May and June. Lambs reaching market in the summer and fall are usually marketed off grass. Almost half of the yearly market receipts arrive during the four months, August to November, inclusive. Fortunately for both producer and consumer, not all of the lambs reaching market during that period are slaughtered immediately. Many of them are taken back to the country to be fattened on grain, alfalfa, and other feed and returned to market for slaughter during the winter and early spring, thus giving the consumer a year-round supply of lamb.

About 65 per cent of the Nation's lamb crop is raised in 13 Western States. Such lambs are raised under open-range conditions and are known in the trade as "westerns." Those raised in California are the first to reach market in the spring, but the bulk of the western lambs are marketed in the summer and fall. From them are selected most of the lambs which are returned to feed lots for fattening for the winter and early spring markets.

Lambs raised from small farm flocks in the Corn Belt and eastern half of the country are known generally as "natives," and because they usually are unsatisfactory for feeding purposes most of them are sold for slaughter as soon as they reach desirable market weights.

The first native lambs to reach market arrive in May from Tennessee, Virginia, and Kentucky, and usually they are in great demand as spring lambs. Practically all the native lambs are marketed by the end of October although scattering shipments are made in November and December.

In the late fall and early winter, market receipts include a large number of "come-backs." These represent lambs which were bought earlier as feeders and sent out to clean up stubble fields and farm roughage. Supplies from January to early April consist mostly of fed lambs from the Corn Belt and the commercial feeding areas of Colorado and western Nebraska. These fed lambs are older and heavier than those marketed at other seasons and sometimes are in less demand because of their weight although they rank high in quality and finish.

One Hundred Million Dollars Yearly for Slaughter Lambs

Lambs sold for slaughter bring producers more than $100,000,000 annually. At least 50 per cent of the inspected slaughter is consumed in the industrial East, comprising the region east of Ohio and north of the Potomac River. New York City alone takes almost one-third of the supply. Fifteen per cent of the slaughter is consumed in the three Pacific Coast States. The remaining 35 per cent is consumed in the other 34 States. If per capita consumption in these States equaled that in the East and on the Pacific coast a great many more lambs would have to be raised to meet the demand.

C. A. Burmeister.

LAND-USE Changes Point to Lessening Need of Expansion The nine years since the World War constitute one of the most extraordinary periods in the history of American agriculture. Never before have statistics shown a contraction in the agricultural area. Yet, despite the decrease of 13 million acres of crop land between 1919 and 1924 indicated by the census, it appears that at no time since 1900 has agricultural production increased at so rapid a rate as in these years since the World War. This is the more extraordinary in view also of the decrease in the number of farm animals, in the number of farms, in the farm population, and in the prices of many farm products.

Apparently, the introduction of the automobile and the tractor, with associated machinery, and the influences exerted by the various agencies for the promotion of agriculture—the agricultural press, the farm organizations, the agricultural colleges, extension services and experiment stations, the State departments of agriculture, the United States Department of Agriculture, and other organizations—supported by stern economic necessity, have led to the adoption of improved agricultural practices more rapidly than in any previous period.

These years since the World War may be characterized briefly as a period of accelerated mechanization of agriculture, with a resultant release for other uses of 15 to 20 million acres of crop land formerly required to feed the horses and mules which have been replaced by tractors and automobiles, and of increasing efficiency of production,

especially in the amount of milk and pork produced per unit of feed consumed.

The increase in total production of the crops (for stock feed, human food, and industrial uses) was nearly 5 per cent, or much less than the increase in population. As total crop acreage decreased slightly, it might appear that a notable increase in acre yields occurred. A statistical study indicates, however, that about two-thirds of this increase in crop production is owing to a shift from the less productive crops per acre toward the more productive. A decrease occurred in the acreage of wheat, as in all the cereals, and in the nonleguminous hay crops, whereas the acreage of cotton, alfalfa, clover, fruits, and vegetables increased notably.

Geographic Shifts in Production

Equally significant have been the geographic shifts in production of the crops. An almost universal decrease in the acreage of the

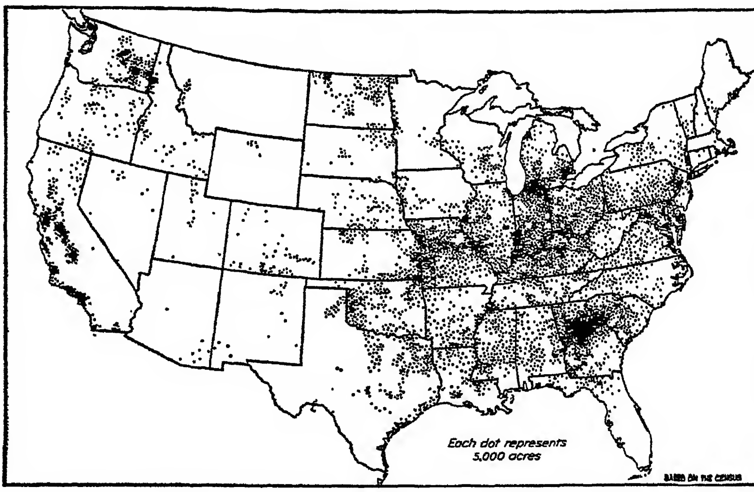

FIG. 138.—Decrease in total acreage of harvested crops, 1919–1924

crops, as a whole, is shown by the recent census in the originally forested eastern portion of the United States, especially high proportionately in the hilly sections, and an increase, not quite so large, in the prairie and Great Plains regions. Apparently the more favorable conditions for the use of large-scale machinery on the level lands of the West, and the development of drought-resistant varieties of crops, have promoted the development of crop production in these regions, despite the occasional occurrence of drought, at the sacrifice of much of the poorer or less level land in the Eastern States. (Figs. 138 and 139.)

The census shows a decrease in corn acreage, for instance, in almost every county east of a line from Lafayette, Ind., to central Missouri and central Oklahoma, and an even more universal and greater increase northwest of this line. Similarly, a heavy decrease in cotton acreage is shown in Georgia and South Carolina, but an even greater increase in Texas and Oklahoma. An increase is also shown along

the northern margin of the Cotton Belt, indicating that lesser injury by the boll weevil in the western and northern portions of the belt has been an important factor in the causing of the shift in acreage.

The decrease in wheat acreage extended as far west as the eastern Dakotas and central Texas, but a small increase occurred in western Kansas and eastern Colorado, and in the western Dakotas and Montana. Oats decreased in southern Indiana and Illinois, Missouri, Oklahoma, and Texas, but the increase in acreage was much larger in Minnesota and the Dakotas. Only in hay is a slight but rather general decrease in acreage indicated in the prairie and Great Plains regions and an increase in Missouri, southern Illinois, Ohio, and the Northeastern States.

About two-thirds of the increase in agricultural production is assignable to an increase of animal products. Much food has been released by the decrease in horses and mules, especially in the Corn Belt and States to the northeast, north, and west. In these North

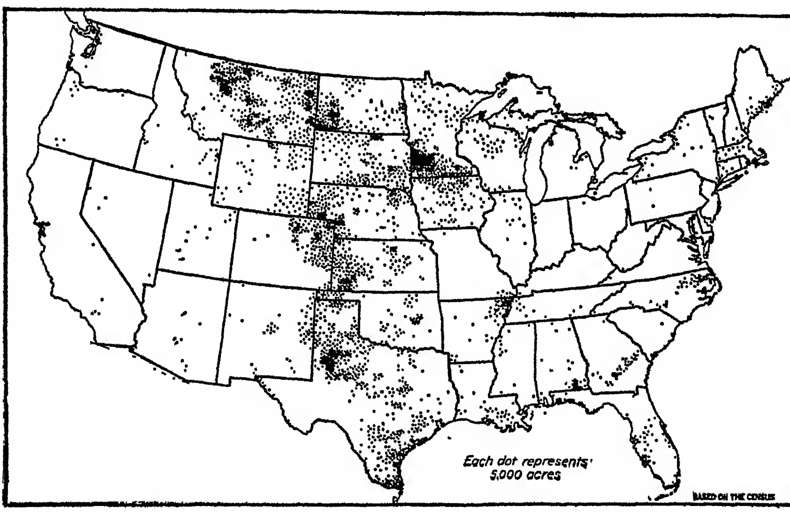

FIG. 139.—Increase in total acreage of harvested crops, 1919-1921

Central and Northeastern States the farm animals are more productive, both per head and per unit of feed consumed, than in the Southern States and most other parts of the country. The partial substitution of tractors and automobiles for horses has had, therefore, a secondary effect in causing an increased concentration of meat or milk production in the Northern States, and as a consequence has contributed to a notable increase in the production of milk and meat (especially pork) per unit of feed consumed. As the acre-yields of the feed crops and the productivity of the pastures are also higher in the Northern States than in the Southern States, the use of tractors in the North has had a third important effect, that of causing the production of more milk and meat on a smaller acreage of land.

Livestock Changes, by Regions

The average decrease in number of cattle in Illinois, Iowa, and Nebraska, for example, between January 1, 1920, and January 1,

1927, according to the estimates of the United States Department of Agriculture, was 15 per cent, and the increase in hogs was 14 per cent, whereas in the 12 States south of the Potomac and Ohio Rivers and the Missouri-Arkansas boundary, where the average value per head is only about three-fifths as large as in these Corn-Belt States, the decrease in cattle averaged 25 per cent, and in hogs averaged 42 per cent. The increase in number of dairy cows and heifers in New York, Wisconsin, and Minnesota was 1 per cent, whereas in the States south of the Potomac and Ohio Rivers and the Missouri-Arkansas line, where the average value per head is less than three-fifths as much as in the three Northern States, the decrease in number was 11 per cent.

Doubtless the heavy reduction of livestock in the South has been owing in part to the competition of the cotton crop, and crop competition may be a factor in other parts of the country. But on many farms in the South, and also in the West and North, the heavy liquidation of beef cattle and hogs has probably been necessary to meet taxes, debts, interest payments, and living expenses; and, in general, the less productive the animals the heavier has been the liquidation.

It is inevitable that the substitution of tractors and automobiles for horses and mules will continue for several years, for not half enough colts are being raised to replace the horses and mules that die. The continued concentration of meat and milk production on the rich lands of the Corn Belt and the States to the northeast, north, and west, where tractors are replacing horses, appears certain. This means greater production per acre, per head, and per unit of feed consumed. In addition, losses from disease will probably continue to diminish, and better feeding, especially the greater use of legumes, will become widespread. More cattle also are likely to be slaughtered at an earlier age, thus increasing the production per unit of feed consumed; the quality of the farm animals will probably continue to improve. All these things increase production without increasing the acreage required to feed the livestock.

Since 70 per cent of the crop land and all the vast acreage of pasture in the United States are used to feed livestock, it is evident that the decreasing number of horses and mules and increasing production of meat and milk per unit of food consumed is greatly diminishing the need for expanding the agricultural area as population increases.

O. E. Baker.

LAND-VALUE Decline in Mid-West Greater than Drop in Earnings During the last six years of drastic readjustments in farm products, prices, and farm real-estate values, what has occurred in the relationship of land earnings to land values? Are land values changing so as to yield a larger rate of return than formerly, or a lower rate?

An earlier investigation by this department [8] showed that farm real-estate values in relation to earnings were neither the same for all sections of the United States nor the same in any given section of the country from one year to the next.

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[8] Chambers, C. R. Relation of land income to land value. U. S. Dept. of Agri. Bul. No. 1224. 132 p., illus., 1924.

The Situation in Iowa

What is the situation to-day? Complete data for other sections of the country are not yet available, but preliminary compilations for 1925 have been made for the 44 Iowa counties covered in a 1920 study. Results of the two investigations, both made by the Division of Land Economics from unpublished data furnished by the Bureau of the Census, are given in Table 10.

TABLE 10.—*Average cash rent, real-estate value, and ratio of rent to value in 44 selected counties in Iowa. Preliminary data from census, 1920 and 1925* [1]

Item	Average amount per acre of item specified		Ratio of rent to value of land and buildings	
	1920	1925	1920	1925
			Per cent	*Per cent*
Gross cash rents	\$8.28	\$7.03	3.4	4.9
Real-estate taxes [2]	\$1.23	\$1.48		
Rents after taxes	\$7.05	\$5.55	2.9	3.9
Depreciation and upkeep of buildings [3]	\$0.72	\$0.76		
Rents after taxes, depreciation and upkeep	\$6.33	\$4.79	2.6	3.4
Value of real estate (land and buildings)	\$244.35	\$143.03		
Number of cases	5,442	3,400		

[1] Farms of one-year tenants unrelated to landlord.
[2] Estimated from State reports.
[3] 3 per cent of building value. Rate obtained from farm-management surveys.

The relationship of values to earnings in 1925 in Iowa was quite different than in 1920. The rate of return has been a widening one. In other words, Iowa land values have fallen more than have Iowa land earnings. Apparently the trend is just the opposite of that which operated in the first 20 years of the century.

What is the significance of this apparent change in trend? In the first place, it probably signifies in part, at least, a readjustment toward what would seem to be a sounder value structure. Certainly a net return of 2½ per cent on the capital value is a rather low rate, especially for beginning owner operators who are attempting to purchase their farms on borrowed 5 and 6 per cent money. Three and one-half per cent will make the overhead somewhat less of a burden. Four per cent would be a still sounder ratio. In any event, in view of a current land bank rate of 5 per cent on conservative first mortgages, the present rate of return as judged from these preliminary results is still none too high.

Increasing Margin of Safety

From the point of view of mortgage lenders and other suppliers of investment money, this increasing margin of safety to the extent to which it represents a genuine readjustment, can but be a favorable indication. To prospective purchasers of farm lands, either for operation or for nonoperative investment, this yield trend must appear in an increasingly favorable light.

Again, students of our agricultural problems have frequently commented to the effect that the farmer's standard of living has been sacrificed all too frequently in the purchase of land. Higher incomes

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have frequently gone into the purchase of more land instead of into more of the comforts of life. Land thus bid up in price by farmers of means frequently has resulted in increasing the difficulties confronting young farmers who wish to purchase farms for operation. Another phase of the situation, has been the frequent sacrifice of an adequate standard of living brought upon young farm families in their attempts to "pay out" on high-priced land.

The Price of Ownership

From the viewpoint of agricultural welfare as a whole there is yet another aspect of the matter. The evils of tenancy have often been emphasized. But even ownership may be purchased at too high a price. A continuously narrowing income-ratio accompanying an upward course of values may finally reach a point at which the advantages of ownership may be more than offset by the comparatively higher financial returns of tenancy.[9]

Certain qualifications are to be noted. The available data are for Iowa only. The underlying operative forces in the first 20 years of the century in Iowa, however, appeared to be typical of what went on in surrounding Corn-Belt States, though frequently with less intensity. It is likely, therefore, that what has been going on during the last six years in Iowa has been going on in adjacent Corn-Belt States.

In the second place the point may well be made that if a progressively narrowing income ratio of the pre-war and war period was brought about by bidding up values in anticipation of even higher incomes and values still later, then perhaps the widening ratio of the postwar period is brought about by farmers who are "discounting" still further declines in income. That may be true. Certainly at present writing one can not say with assurance that the bottom has been reached in Corn-Belt land values, but the probabilities seem to point toward the conclusion that a substantial element in the new trend is a genuine readjustment of values toward a sounder relationship to income.

Cash Rents as Measure of Earnings

In the third place, cash rents are assumed to be an adequate and representative measure of the earnings attributable to the real estate as such. The extent to which this is true, requires further investigation. In Iowa, however, where entire farms, rented for cash, constituted some 17 per cent of the total farm acreage in 1925, cash rents are probably a fairly representative measure of the valuation competitively placed upon a single year's use of the real estate. Data in Table 10 are for farms of one-year tenants who are not related to their landlords. These are considered to represent competitive market rents as closely as possible, the lowering effect of kinship and length of tenure being eliminated in so far as the data permit.

And finally, sight must not be lost of the fact that the gains of the apparent new alignment are small compensation to those former owners whose equities have been wiped out by the depression. The

[9] For an example of this see GRAY, L. C., and LLOYD, O. G. FARM-LAND VALUES IN IOWA. U. S. Dept. Agri. Bul. No. 874. 45 p., illus., 1920.

readjustment toward a better basis for the industry as a whole have been at the expense of tremendous individual losses. Comment has frequently been made that the farmer is also a real estate speculator. That may be rather an overstatement of the case. Nevertheless, it is clear that no farm purchaser can escape the fact that he makes a commitment in something which may or may not be worth what he paid for it 5, 10, or 20 years later. Land may "stay put," but land values do not. And ordinarily that commitment represents from two-thirds to four-fifths of the owner-operator's entire capital requirement—for many it represents their entire lifetime's "stake." Obviously the shifting nature of the farm investment can not be evaded, nor the further fact that land values may run away from earnings. Paying too much now, on the assumption that future increases will make up for it later, seems an uncertain business. If the assumptions are unrealized, the seller loses. If realized, the new purchaser starts with the handicap of a low rate of return on his investment. Might not the industry be better off, all around, if the postwar readjustment, purchased at a cost of such heavy individual losses, could be made a thorough and complete one, and the behavior of values, and their relation to income, be accorded more recognition than they have at times received in the past?

E. H. Wiecking.

LARCH CANKER, New Unwanted Immigrant, Attacks Fir and Pine

Lurking in a small area in eastern Massachusetts is a newly imported tree disease which before it ends its career in North America may cost this continent hundreds of millions of dollars. It is the European larch canker, a disease long known in Europe and native there, which in the last hundred years has caused great damage to the native larch of Europe.

If in America this disease would continue to limit its attentions to the various kinds of larch, its appearance here would not be a matter of alarm. The eastern North American larch, tamarack or hackmatack, as it is best known in New England, is widely distributed, practically covering the north of the continent from New England to British Columbia and Alaska, but it is not at present a valuable tree and is subject to the periodical attacks of a serious insect enemy, a sawfly. The two western larches, occurring mainly in Idaho, Washington, and Montana, are locally valuable timber trees, but their range is limited. The European larch is planted in the East in increasing numbers, but the Japanese larch could be substituted for it in practically every case, and the Japanese larch is resistant to the canker.

But, as is so often the case with an introduced disease, the larch canker is not behaving in Massachusetts quite as it does in Europe. It is not only attacking European and American larches, as would be expected, but is also attacking planted Douglas fir with great virulence. (Fig. 140.) What is even more unexpected, it has attacked planted trees of western yellow pine. Douglas fir is perhaps the most important single species of forest tree in North America, and western yellow pine is widely distributed and valuable. Any disease that could make serious inroads on either of these trees would quickly assume the proportions of a national calamity.

It may seem a far cry from a few dead planted trees in eastern Massachusetts to the great natural forests of the Pacific coast and Rocky Mountains. But the tamarack, already attacked by the disease, forms a natural bridge, continuous across Canada, from these few infected trees in the East to the Douglas fir, western yellow pine, and western larch.

The European larch canker is a bark disease of the same general type as the chestnut blight, which it strongly resembles. On European larch it girdles and quickly kills young trees, but is not inclined to girdle older ones completely. Instead it forms one or more permanent cankers on the trunk, spoiling the tree for timber and producing weak spots at which the tree readily breaks under stress of wind or snow. In Europe the disease is distinctly favored by moist or foggy climate, which is the prevailing climate of those parts of the Pacific coast where Douglas fir grows best.

FIG 140.—A young Douglas fir attacked by European larch canker. Pitch from the canker shows white in the picture

Up to October, 1927, the European larch canker has been found only in an area in eastern Massachusetts about 14 miles long by 4 wide. If it has not been introduced in any other place within attacking distance of the hackmatack, and is really restricted to this small area, it might still be possible to stamp it out, although both the practical and technical difficulties of such an undertaking would be serious. But whatever is done must be done soon, for if the disease once becomes established in the tamarack of northern New England and Canada it will be beyond practical control and will spread unhindered to the Pacific coast.

HAVEN METCALF.

LEGAL Work of the Department Has Extreme Range

The legal work of the United States Department of Agriculture is performed under the direction of the solicitor, who is assisted by a corps of lawyers, each of whom specializes in particular activities of the department. Some of these assistants are stationed permanently away from Washington, to expedite the settlement of legal controversies in which the department is involved or to give legal advise to administrative officers. The variety of legal matters passed upon by the solicitor's office is surprising. Hundreds of criminal cases arise each year under the statutes administered by the department. Numerous cases are prepared for the redress of civil wrongs suffered by the United States in connection with its property. Equitable relief is often sought and many constitutional questions are considered. Many constitutional precedents are the result of actions in which the United States was a party. Cases involving such questions must be painstakingly prepared, since the validity of the laws involved is at stake.

Ordinarily the authority of the department is questioned by an individual or a group of individuals, but controversies occasionally arise between the United States and a State. Such was the case recently when the Government brought an action to restrain certain officials of the State of Arizona from interfering with employees of the United States in the contemplated removal of deer from the Grand Canyon National Game Preserve in Arizona. The plan of the department to remove the deer conflicted with the laws of the State. The lands in the game preserve were within the Kaibab National Forest. Owing to certain natural barriers surrounding the forest and game preserve, as well as by virtue of protective measures in their behalf maintained by the United States, the deer on the preserve had increased so rapidly that they were causing great injury to the public lands by overbrowsing and killing various forms of forest growth, and also were starving. Starvation is said to have caused the death of approximately 10,000 deer since 1924.

Seeking a remedy, the United States, through the department, gave the game warden of Arizona permission to drive 5,000 deer from the reserve. This plan, as well as other undertakings to reduce the number of deer on the preserve, met with failure. Finally, the department, as a last resort, determined to issue permits to hunters to kill a prescribed number of deer for the purpose of disposing of 10,000 of the animals. Three of these authorized hunters were arrested by a State officer and charged with the possession of deer in closed season, contrary to the laws of Arizona.

State Ownership of Game Claimed

Subsequently the governor of the State, through an executive order, asserted State ownership of all wild animals and birds in the State. The United States claimed a constitutional right to deal with the situation existing on the national forest and game preserve in its own way, without regard to the laws of Arizona. A decree has been handed down by three Federal judges enjoining the State officials from enforcing the State game laws against the officers and employees of the United States engaged in killing and disposing of the deer on the national forest and game preserve, in accordance with the regulations of the Secretary of Agriculture. It is stipulated, however, that the decree shall not be construed to authorize the licensing of private hunters to hunt deer in violation of the laws of the State. The decree was a victory for the United States. The case involved novel and highly interesting constitutional questions and attracted much attention.

It is not unusual to note in the public press that an officer of the United States, during the performance of his official duties, has been deprived of his liberty by the peace officers of a State. The Department of Agriculture is not without its problems in this respect. A forest ranger employed by the United States and located in West Virginia was required to carry a pistol in the performance of his duties as a Federal officer. He was arrested and convicted in Tucker County, W. Va., for carrying a pistol contrary to State law and sentenced by the circuit court of that county to six months in jail and to pay a fine of $100.

The ranger was discharged from custody by the judge of the United States District Court in a habeas corpus proceeding instituted by the

United States. The court held that the "pistol toting" law of the State could not legally be invoked against a representative of the United States who is engaged in duties pertaining to the Federal Government, the performance of which necessitates the carrying of firearms. The case aroused considerable interest in the department, and, as stated in the decree releasing the forest ranger, was viewed with much concern by the court. Its conclusion favorable to the Federal officer was of great importance not only to this department but to other Federal agencies.

Many Laws Unpopular

While it is true that, as a general thing, laws on particular subjects are the results of popular demand, many laws are exceedingly unpopular in some quarters. Moreover, the importance of many laws is underestimated; they are regarded quite generally as being trivial. This situation is illustrated in the enforcement of the plant quarantine act of August 20, 1912, which regulates the importation and interstate movement of plants and plant products. Insects and plant diseases involve a serious risk to agriculture, but for years this accepted truth was not given the consideration it deserved. The maximum punishment for a violation of the plant quarantine act is a fine of $500 and one year's imprisonment. Yet, for 20 years after the act was passed, the usual penalty imposed was $5 fine and punishment by imprisonment was not even suggested. Only a few years ago, in a case which the department regarded as involving a serious danger, the offense was considered so trivial by the court that the defendant was merely sentenced to be paroled in the custody of the marshal for one hour. Times change, however, and the attitude of the courts has also changed concerning the seriousness of violations of this act, as indicated in several instances during the past year. In the recent case of United States *v.* American Railway Express Co., involving the interstate shipment of ornamental stock, nursery stock, and farm and garden products from a territory quarantined as being infested with the Japanese beetle, the seriousness of the offense charged was emphasized by the Federal court by the imposition of a fine of $750 on the three counts involved. In United States *v.* Pedro Castanado, a late case in which the defendant was charged with attempting to bring avocados with the seed from Mexico to the United States, punishment by a fine of $100 or 30 days in jail was prescribed. Such results encourage those charged with the administration and enforcement of the law.

Hazards of Law Enforcement

Enforcement of some laws and regulations of the department is attended by great personal danger and has at times resulted in the death of employees. In March, 1927, Forest Clerk William C. White was shot to death while assisting in the proposed arrest of a man thought to have set fire to the Lincoln National Forest in New Mexico. The fire was discovered near the home of a ranchman, under circumstances which indicated an incendiary origin. Firearms kept in the car of the fire fighters were taken and the fire fighters were fired upon. The ranch owner is said to have told neighbors that he would burn the forest grass and kill any man who attempted to extinguish the fire.

After the shots were fired he was said to have acknowledged the act and gone into hiding. A sheriff's posse was organized to arrest him. Forest Clerk White drove the automobile in which the posse traveled. The fugitive was located standing by his horse. A deputy sheriff advanced unarmed from the car, which had been stopped about 30 yards from the man, but, observing that the suspect was disengaging his rifle from its scabbard, he ran back to the car for his rifle, warning the rest of the posse as he returned. Almost immediately, however, White slumped in his seat, mortally wounded from a shot fired by the incendiary who in turn was killed by the posse.

H. N. Foss.

LIBRARY of 200,000 Volumes Maintained in the Department

Henry Leavitt Ellsworth, the first Commissioner of Patents, often referred to as the "father of the Department of Agriculture," because of his advocacy, while Commissioner of Patents, of governmental aid for agriculture, emphasized in his first report, for 1837, the need for a separate library for the Patent Office, saying that "the necessity of a library of scientific works, to facilitate the discharge of the duties of the office, needs only to be mentioned to be duly appreciated." When the Agricultural Division of the Patent Office, which had been created in 1839 as a result of Commissioner Ellsworth's efforts, was transferred to the new Department of Agriculture, established in 1862, the collection of agricultural books which the division had made was also transferred. Thus began the library of the United States Department of Agriculture.

From about a thousand volumes in 1862 the library has grown until it now contains more than 200,000 volumes. It receives currently more than 3,400 different periodicals and as many more bulletins, reports, proceedings, transactions, etc., from other agricultural and scientific institutions. These are received from all over the world, furnishing an invaluable record of the current progress of agriculture and of scientific discovery.

The library is a scientific and technical library—not simply an agricultural library, for the work of the department reaches out into many fields and the library must follow it.

Subjects covered in this Yearbook suggest the scope of the library. It is strong not only in agriculture in all its branches, including animal husbandry, dairying, veterinary medicine, plant industry, agricultural statistics, and agricultural economics, but also in various sciences pertaining to agriculture such as botany, chemistry, zoology, entomology, biology, plant pathology, bacteriology, and meteorology.

Farmers Indirectly Benefited

The help given by the library to farmers, though indirect, is important. The farmer does not usually come to Washington to consult the books in the library but the publications of the department go to the farmer. They go also to housewives, to public libraries, to colleges and experiment stations, and to other scientific institutions all over the United States. Many scientific institutions in foreign countries likewise receive the department's publications, so that their benefits are widespread. In the preparation of these

publications and in all the daily work and investigations of the department the library's collections are in constant use. Practically every new scientific problem requires preliminary research in the literature of the subject before experiments are begun.

The library maintains an extensive dictionary card catalogue of all the library resources of the department. This now numbers more than a half million cards. It is supplemented by special catalogues and indexes in the various bureau libraries. Some of the largest of these are the botany, entomology, and forestry catalogues, the index of veterinary literature, the index of agricultural economics literature, and the index to roads and rural engineering literature. These together number another half million cards and form with the general catalogue of the library an invaluable record of the literature of agriculture and the related sciences. They are the keys which open up the contents of the library and are the greatest aid in its service. The library has prepared printed cards for all the publications of the department. These are included in the Library of Congress series of printed cards and are available for purchase by libraries or individuals. Printed cards are also prepared for the accessions to the library and like the cards for department publications can be obtained by purchase from the Library of Congress.

Branch Libraries for Bureaus

In the broad outlines of its organization the library resembles that of a university library with its various departmental libraries, which correspond to a certain extent to the bureau libraries of the department. The bureaus which now maintain libraries are as follows: Agricultural Economics, Animal Industry, Chemistry and Soils, Dairy Industry, Entomology, Home Economics, Plant Industry, Public Roads, Office of Experiment Stations, Fixed Nitrogen Research Laboratory, Forest Service, and the Weather Bureau. These bureau libraries are not separate and distinct libraries but are administered as branches of the main library. They with the main library form a unified library service for the whole department.

Although primarily for the use of the department, the library is free for reference to all who wish to use it. It also lends its books for purposes of research to various libraries and institutions throughout the country, but especially to the State agricultural colleges and experiment stations. The library is being called upon more and more each year by investigators outside of the department to answer bibliographical questions which come within its scope. In the extent of its collections and the scope of its service it endeavors to serve as the national agricultural library.

CLARIBEL R. BARNETT.

LIBRARIES for Rural People Springing up but More are Needed

The free public library is recognized as our second line of educational defense. The problem is to make it universally available. Eighty-two per cent of rural people are without public library service.

Thirty-eight States send out traveling and package libraries, which perform a limited service and emphasize the real problem.

Most cities restrict the free use of their libraries to residents, and nonresidents pay a fee. A rural library survey reveals that such privileges are little used by country residents who hesitate to use city institutions. In many rural towns there are membership-fee libraries in which book service is confined to those who pay the fee.

Such rural public libraries as exist are often of the community type. Sponsored by some town club as a holding company, the library is established and maintained by financial campaigns which sometimes include country people. A building is often erected in the same way.

Successful rural libraries of this character may be found, among other places, at Clinton and Princeton, Ky.; Lincoln Park, N. J.; Youkon, Okla.; and Bel Air, Md. Each of these communities spent from $1,000 to $4,000 for a building, open to town and country people. Bel Air has a county association with 200 members. Four branch libraries are maintained in country stores or homes.

Some tax-supported town libraries are more than just a book collection and extend the use of books not only to town but to farm people. The library at Thorpe, Wis. (population 796) serves the country people 10 miles out. Maintenance is largely by the village tax of 0.8 mill. Library interest is manifested by a new $5,000 building financed by the town and country community through contributions and entertainments.

Another type has the township as the tax unit as at Peabody, Kans., where 0.5 mill realizes $2,250 annually. The school district is the tax area in other types. At Milan, Ohio, population 652, the budget is largely made up from tax receipts of $2,527 from a school district valuation of $3,888,123, at 0.6 mill. From the library of 7,559 volumes, 621 farm and 426 town people borrowed 19,269 books in 1925.

Two Kinds of County Libraries

A recent type is the county library, of which there are 245 in this country. They are of two kinds and are generally adopted by popular county vote; the county contracts with a city library or adjacent county library to give county service, or the county establishes a separate library and existing libraries are excluded from the county library and tax area if they prefer.

The library of Cooke County, Tex. (population 25,667), was provided by majority county vote, excluding Gainesville, whose library later entered the system. In 1925 there were 25 county branches and 54 school stations. Branch circulation was 17,930; school, 4,106; total circulation 22,036. Borrowers at the central library numbered 2,863; branches, 2,448; total borrowers in the county, excluding schools, numbered 5,311. Books loaned to branches totaled 7,470; to schools, 1,363. Library maintenance by city totaled $1,500; county, $3,500. Library cost per capita was 17½ cents; county tax valuation was $16,362,350.

Coahoma County, Miss. (population, 41,511), contracts with Clarksdale public library at $4,000 a year. A librarian with a book automobile carries 600 books daily to some of 24 county branches, totaling 13,050 books yearly. (Fig. 141.)

Burlington County, N. J. (population 81,770), voted a separate library. One-fifth mill library tax gave $11,952 in 1926, which provides a separate library building, a staff of four, and book-automobile

service of books, pictures, films, and phonographic records to 135 county branches. Forty branches are in schools; others are in stores, grange halls, and farm homes. The number of books at a branch varies from 50 to 1,000, changeable monthly

FIG. 141 —Public library at Clarksdale, Miss, and the book automobile of Coahoma County department which serves the rural people

Los Angeles County Library

The library of Los Angeles County, Calif., established by popular vote, excludes Los Angeles and 15 other cities that have libraries. Its 0 4 mill tax in 1926 produced $237,889.32 to place books in 182 community and 154 school branches serving 408,963 country people. The farthest branch is 116 miles from headquarters. Two book automobiles make daily trips, averaging 100 miles each, exchanging books between the central library and the branches. The branch libraries circulate 1,277,098 books and 153,572 pamphlets, periodicals, films, etc., to 79,864 borrowers yearly.

A county library has a large population and a large finance area which make for economic, efficient, and democratic administration; it has a large book collection, trained extension librarians, numerous rural branches with changing collections and supplementary schoolbook service.

WAYNE C. NASON.

LIGNIN Experiments Show Some Uses for Many Farm By-Products In the so-called lignified or woody portion of plants, such as straw, cobs, hulls, and stalks, and in all woods there is associated with the cellulose a substance or a group of related substances which the chemist has designated as lignin. It is an amorphous, resinous mate-

rial ranging from light brown to black, depending on the method used in its isolation. The quantity of lignin in various plant substances varies greatly. In corncobs it may be present to the extent of 20 to 25 per cent of the dry weight of the cobs, and in wood, to the extent of 30 per cent. Lignin is not generally found in the free state in the plant, but is combined with the cellulose and can be separated from it only by suitable chemical treatment

A lignified plant substance, as, for example, corncobs, consists of three main constituents, namely, cellulose, pentosans, and lignin. Cellulose is the raw material from which all paper is made. It is used also in the making of explosives, rayon (artificial silk), varnishes, and lacquers. As the direct result of work done by the Bureau of Chemistry and Soils, the pentosans of corncobs, oat hulls, and similar materials are now utilized in the manufacture of furfural, a chemical substance used largely in the preparation of synthetic resins. Lignin, on the other hand, is entirely wasted. In spite of much work that has been done here and abroad with the view to its economic utilization, nothing definite has as yet been developed.

Lignin a By-product of Pulp

Commercially, lignin is obtained as a by-product in the preparation of paper pulp from wood. When wood is digested with calcium bisulphite or caustic soda under pressure, the lignin is dissolved, leaving the cellulose in a more or less pure state. The lignin obtained in this operation is discarded, and when one considers the enormous quantity of wood used in the pulp mills of this country, the wastefulness of this operation will be readily realized. Indeed, lignin is now, without doubt, the greatest agricultural waste product. Sporadic attempts have been made to utilize the lignin as a binder in road building, in briquetting, and as a tanning material, but none of these methods has met with any appreciable success.

Because of the great importance of lignin to the agricultural industry the department deemed it advisable to reinvestigate this problem with the view to developing useful products from it. The work was confined to lignin obtained from a sulphite paper mill and to that isolated from corncobs.

Lignin is known to be of phenolic nature, that is, it is chemically related to such substances as carbolic acid and naphthol, both of which are used extensively in the preparation of dyes. As a matter of fact, it was found that lignin could be substituted for carbolic acid or naphthol and satisfactory dyes obtained. A number of aromatic bases such as aniline, toluidine, benzidine, and alpha- and beta-naphthylamine were diazotized and coupled with sulphite lignin. Dyes were obtained ranging from yellow to brown. These dyed both silk and wool and were not affected by light and washing The encouraging results obtained in these experiments have indicated the line of research that is to be continued on the utilization of lignin in the preparation of dyes. Furthermore, experiments thus far carried out definitely indicate that besides azo dyes, indophenols may also be obtained.

Lignin from Corncobs

Lignin was obtained from corncobs by digestion with caustic soda, filtering, and precipitating the lignin by the addition of acid.

When dried it was obtained as a brown amorphous powder. Although lignin is quite insoluble in the ordinary organic solvents, it was found that it dissolves very readily in mixtures of these solvents, such as alcohol and benzol, alcohol-benzol and acetone, or alcohol-benzol and furfural. Such solutions containing lignin in suitable concentration were found to be fairly good varnishes, comparing favorably with the cheaper commercial varnishes. The lignin varnish has the advantage of many varnishes on the market, in that it is waterproof and acid proof. It might be used in mixing dark-colored paints and enamels. When subjected to destructive distillation, lignin yielded among other things acetic acid, acetone, wood alcohol, guaiacol, and eugenol. Eugenol is the active principle of oil of cloves and is used extensively in the pharmaceutical industry. The experiments thus far conducted on lignin, although only preliminary, indicate the possibility of developing useful products from this waste material.

MAX PHILLIPS.

LIVESTOCK a Vital Necessity in the Southern States Consumption of pork per capita is considerably higher in the South than it is in the country as a whole. In 1925 the consumption of pork in the United States was 77 pounds per capita, whereas in 7 cities of the South the average consumption was 95 pounds. Over one-third of this pork used in the South was dry salt pork, of which the negro population consumes large quantities. A recent survey of the coastal plain showed that 75 to 80 per cent of the pork consumed in southern cities was produced in the North. Because this area is far from meeting its own needs in pork production such an enterprise might profitably be added to the production program of many southern farmers, especially those in the coastal plain.

About one-half as much beef as pork was consumed per capita in most of the cities studied. Although the South as a whole produces a much larger proportion of the beef than of pork consumed there, the larger cities use only a small percentage of southern-produced beef. Nearly all of the better quality beef is shipped in from the Middle West. Sections in the South especially suited to the production of beef cattle, such as the black prairie belt, can help to meet this need. The required finish can be put on cattle from this belt in the velvet-bean fields of the coastal plain.

It is impossible to make a reliable estimate of poultry and egg consumption in southern cities because of the many channels through which these products reach the consumer, but the study showed that a tremendous quantity of these products is shipped in. In three of the smaller cities from 4 to 10 dozen eggs and a small quantity of live or dressed poultry per capita were shipped in; in larger cities the quantity of poultry shipped in per capita amounted to 5 and 12 pounds and of eggs, 11 and 14 dozen, respectively.

An expansion of the poultry enterprise through farm flocks and specialized poultry plants to meet more fully the deficiency in this area seems desirable. Producers should understand, however, that they will come in direct competition with highly specialized producers in other areas and with the farm flocks of the Corn Belt.

The per capita consumption of milk in cities and on farms in the South is very low. In 1925 the per capita consumption of milk and cream in seven cities was 0.48 pint per day compared with an average of 1.03 pints in eight cities in other parts of the country. Various surveys of farms show the per capita consumption to be 0.38 pint in several southern areas and an average of 1.13 pints in other parts of the United States.

Two main reasons for this low consumption are: (1) Good pastures are lacking, consequently prices for milk are high in many cities; and (2) negroes, who are small consumers of milk, make up a large percentage of the population.

A great increase of milk consumption in this area can be brought about by development of lowland pastures and the addition of the dairy enterprise where it is economically feasible, and teaching consumers the benefits of milk in the diet.

The consumption of butter per capita in this area seems to be about 50 or 60 per cent of the per capita consumption of the United States. This low consumption is probably largely due to the large negro population.

In three of six representative cities in the coastal plain as much or more butter than was consumed was made from locally produced or shipped-in cream. In the other three cities a greater part of the butter was shipped in. Butter, cheese, and condensed or evaporated milk are relatively high in value per pound, and it is easier to ship them long distances than it is to ship milk. The production of milk in the South for conversion into these products is therefore carried on in direct competition with producing areas in the North.

This factor of competition from northern areas is usually absent in the case of milk produced for consumption as whole milk or for conversion into ice cream. Any increase in consumption of milk and ice cream in the South must result from an increase in local production, whereas an increase in the consumption of butter and other dairy products could be supplied by shipping in from other parts of the country.

R. D. JENNINGS.

LIVESTOCK Estimates Anticipating Receipts Aid Orderly Selling

Perhaps no one phase of the livestock market news service conducted by the Department of Agriculture attracts more attention on the part of trade interests at market centers than the so-called advance estimates of receipts. But it is doubtful if any one feature of the service is so little understood by those it is designed to serve. Conditions operating to affect its accuracy are as little understood.

At about 11 a. m. daily, excepting Saturdays, the thought "How many for to-morrow" is in the mind of everyone actively in the trade on the Chicago market. To a somewhat less degree similar interest exists in the advance estimates of receipts of cattle, hogs, and sheep at several of the other large mid-western markets where such reports are released and in the Chicago estimate at these and other primary market centers.

As it is regarded as the basic livestock market of the country, the greatest interest revolves around the Chicago report. Immediately upon, or shortly after, its release at 11 a. m., this report is flashed

by radio, telegraph, telephone, and other means of rapid communication to other markets and to livestock producing and feeding areas the country over. It is more or less generally utilized by prospective shippers as a guide in their immediate marketing procedure.

The fact that advance estimates do not always closely match actual receipts may be, for the department, a cause for congratulation or the basis for anxiety and reproach. The reaction experienced should not depend on the mere fact of this disparity but on the reason for the disparity. The advance estimates are presumed to reflect stockmen's intentions to ship for the next day's market.

If they accurately represent such intentions, on the basis of correct railroad reports and other pertinent available information, any dissimilarity between the estimates and actual arrivals is not chargeable to those responsible for the advance figures. On the contrary, such a dissimilarity, if tending to cause a more even distribution of livestock at markets in harmony with actual trade requirements, suggests that one of the main objects of the report has been accomplished.

Changes in Shippers' Plans

Careful check of the railroad reports which form the principal basis of the estimates reveals the fact that discrepancies between them and actual railroad deliveries of receipts are usually due largely to changes in shippers' plans and not to inaccuracies in the department's basic information. A prominent railroad official who has cooperated whole-heartedly with the department by supplying the most nearly accurate advance information possible on livestock loadings said:

> It is my belief that only those engaged in the department's market news service can begin to appreciate the far-reaching effect of that service on day-by-day livestock marketings. Livestock producers and shippers are now in a position to receive at almost any hour of the day by radio, telegraph, or telephone dependable, up-to-the-minute market information which, prior to the development of the department's service and extensive use of the radio, usually was many hours old before it reached them.
>
> When he orders cars to-day to load for to-morrow's market the prospective shipper now knows, if he utilizes the market information, to-day's supply and demand situation, the current trend of values, and prevailing prices. By noon to-day, or thereabouts, he has received reports based on as reliable information as can be supplied, showing prospective receipts for to-morrow. The wide-awake shipper naturally utilizes this information. If the supply and market conditions seem to him unfavorable he often cancels car orders. In the event the market news and advance supply figures seem in his favor he often loads cars that have not preveiously been ordered and consequently had not figured in the prospective supply. Not infrequently, when late market information suggests the wisdom of such action, he diverts shipments to another market or orders shipments to be held out at some feeding station en route. These last-minute changes in shippers' plans sometimes prove costly to the carriers but, realizing that the service is of great financial benefit to our patrons and feeling, therefore, that in the long run it will be beneficial to us, we are more than willing to cooperate.

Reports Promote Orderly Marketing

The changes in shippers' intentions, which have been found to vary in more or less direct proportion with the extent of price advances or declines in the current market and with the estimated supply for the following day, occur daily in so far as they have a bearing on shipments originating in territory within approximately a 16-hour rail run to the market, since shipments from such com-

paratively near-by areas are loaded around noon or later for the next day's market.

Changes in shippers' plans with respect to marketings, severe storms, railroad wrecks, washouts, and other factors with their consequent effect on loadings and delays in train service all tend, at times, to throw the advance estimates out of alignment with actual receipts and in large measure explain the discrepancies occasionally noted. In so far as the accuracy of the advance estimates is affected by changes in shippers' intent, which changes are based on the receipt of timely and reliable market information including the prospective supply data, the discrepancies tend to show the value of the advance report in assisting more orderly marketing.

E. W. Baker.

LIVESTOCK Slaughter is Efficient Under Federal Inspection Some of the larger slaughtering establishments in the United States slaughter as many as 1,200 hogs an hour and reach a total of 10,000 or 12,000 hogs in a single day. After being delivered to the establishment holding pens, the hogs either are driven up an inclined runway or are taken by elevator to the slaughter department, which is usually on the top floor.

Then 20 to 30 hogs are driven into a shackling pen built so as to enable the shackler to shackle the animals readily by placing hook chains about their hind legs below the hock. The other end of the shackle chain is hooked to a large wheel hoist, and the hogs, in rapid succession, are hoisted and automatically carried to the sticking and bleeding rails. The sticker inserts a sharp knife into the neck to sever the principal blood vessels, so that the animal bleeds freely and dies quickly, after which the hog is dropped into a scalding vat. Scalding vats vary in length, some being 70 feet long. The water is held at a temperature close to 140° F. The hog is completely submerged to soften the skin and loosen the hair. When the scalder can knock off a patch of hair with his dipping hook, the scalding is considered complete. The hogs are being constantly dropped into the vat and are as frequently removed at the discharge end, a hog remaining in the vat from two to five minutes, depending on the rate of slaughter. At the discharge end of the vat a hook is placed in one hind leg, near the foot, and the other end of the hook, or chain, is attached to a conveyer chain which carries the hog into the dehairing machine. Dehairing machines are inclosed and are fitted with parallel shafts to which beaters are attached. As the hog is conveyed through the machine, the revolving shafts cause the beaters to strike the hog in every part, knocking the hair off. As the hog emerges from the dehairing machine it is quickly gambreled and placed on rollers to be taken along the dressing rail by a moving conveyer chain.

Workmen, stationed along the dressing rail, complete the cleaning of the carcass as it passes by, removing any remaining hair and scurf by the use of scrapers and sharp knives. The carcass now reaches the header, who partially severs the head from the carcass, exposing the glands of the head so they can be readily examined by the Federal inspector. As the hog reaches the place of evisceration it is opened completely and the "gutter" removes the entire set of viscera in

almost one sweep of his knife and deposits the viscera in a pan or compartment of the moving-top viscera-inspection table paralleling the dressing rail. The dressing-rail conveyor and the pans of the viscera inspection move at the same speed, permitting the Federal inspector to examine the viscera and also maintain the identity of the viscera with the hog. The carcass continues along the dressing rail and is split, examined by another Federal inspector, the leaf fat, kidneys, head, and other parts are removed, and finally the hog reaches the chill rooms, where it remains for chilling. The following day the carcass is cut into the hams, loins, shoulders, and other market cuts for the trade.

Slaughter of Cattle, Calves, and Sheep

The slaughter of cattle differs from that of hogs. The cattle are driven into knocking pens and stunned by a blow on the head with a long-handled knocking hammer. As the front gate of the pen is hoisted the floor tilts, causing the animal to roll to the floor of the dressing department. The shackle chain is placed about the hind legs and the animal is hoisted to the bleeding rail. Here an employee slits the skin of the neck, inserts a sharp knife and severs the principal blood vessels, causing the animal to bleed to death in a short time. The head is skinned out, removed from the carcass, placed on racks or conveyor hooks, and there held for examination by the Federal inspector. After the removal of the feet and the skinning down of the hide on the sides, the carcass is placed on the dressing rail. As it moves along with the conveyor chain, it passes over the moving-top viscera-inspection table. The viscera are then removed from the carcass and examined by Federal inspectors. The carcass continues along the rail for splitting, trimming, and washing. It finally reaches the coolers and is held there for chilling until cut into quarters and other cuts for the trade.

The slaughter of calves and sheep is done by shackling and hoisting on a wheel hoist and placing on the rail for sticking and bleeding, after which the carcasses continue along the dressing rails for evisceration, inspecting, and finishing as in the case of the other classes of animals. Here again the use of the conveyor chain makes it possible to slaughter rapidly.

A. D. Bullock.

LUMBER, Whether Dry or Green, Should be Stored Under Cover Whether the quantity of lumber on hand is large or small, it is essential that proper care be taken of it at all times in order to secure the greatest satisfaction in its use and the least depreciation during its seasoning and storage. Rotten or even partly decayed wood should never be piled with or allowed near sound lumber—it should be burned. As a general rule, lumber, whether green or dry, should be stored under cover to protect it from rain, sun, and snow. Where no shed or other structure is available and the lumber must be piled in the open, a roof of boards is generally used. This is best made of two layers of inch boards, so arranged as to overhang sides and ends of the pile at least a foot all around. In windy exposures the roof should be fastened down to the pile. It should be raised about 2 inches above the pile at the back and about 6 inches at the front.

An exception to the general desirability of piling in sheds must be made in the case of green sapwood of southern yellow pine, the western pines, and red gum, which must be dried very rapidly to prevent blue stain or decay. With this material a very open outside pile (preferably with a board roof) should be used and the lumber should not be piled in sheds until quite dry.

Foundations for Lumber Piles

Lumber should never be piled on the ground. Firm, level foundations should be provided, so arranged that the bottom course of lumber is at least 12 inches above the ground at the lowest point. For lumber piled in sheds affording good protection, the pile foundations may be level in both directions. For lumber piled in the open, the foundations should slope from front to rear at least an inch per foot, to provide drainage for rain water and melted snow.

The foundation for an open pile should provide a supporting timber, crosswise of the pile, every few feet throughout its length. The supporting timbers should normally be spaced not more than 3 or 4 feet apart. For bulk piles, foundations of this type or solid floors may be used. Floors should be clean and dry.

Width of Open Piles

The width of open piles should seldom exceed 6 or 8 feet, and only even-length boards should be piled in any one pile if possible. When this can not be done, the pile should be built up full length of the long boards and the shorter boards laid flush at one end—at the high end in the case of outdoor piling.

The boards in each course or layer of an open pile should be spaced about 3 inches apart, and in outdoor piles succeeding layers should project slightly toward the front or high end, so that the finished pile will have a forward pitch of about an inch to the foot.

Stickers or battens should be laid across each course. They should be arranged carefully in vertical rows, one row over each supporting timber. The stickers, usually about three-quarters inch thick by 2 to 4 inches wide, should be dry and sound.

Rolf Thelen.

MANGANESE, Needed by Plants, is Deficient in Some Soil Types

Recent research has shown that manganese is essential to plant growth. It has been rather generally believed that only 10 chemical elements were essential, and that the element manganese was merely an accidental constituent of plants and played no part in their growth and development. It is now known that this element is important in the production of the green color of plants, the chlorophyll, through which the most important plant processes of growth take place.

Manganese is an element like iron, and almost as widely distributed in nature. That its compounds are necessary to proper plant development has been demonstrated by carefully controlled experiments. The question might be raised, "Has this scientific knowledge of the

fact that manganese is essential to green plants any practical significance?" The answer is, "Yes." The recent observation that manganese may be so deficient in certain soils as to hinder or prevent the proper growth of crops brings the economic importance of this discovery to the attention of the man on the farm.

Most soils contain some of all the important mineral elements of plant foods; but in practical agriculture it has been found increasingly necessary for economic production of crops to supplement this native store of plant-food elements with added mineral fertilizers. In the future attention will be given to the addition of manganese to such soils as can now be shown to be deficient in this element. An illustration of this is a rather peculiar soil found in Florida. This

FIG 142—The effect of manganese on tomatoes growing in a Florida soil Note the chlorotic leaves and poor growth without fruit, A, as compared with the normal growth and fruiting of the plant, B, to which manganese had been supplied. Both jars were well fertilized with a complete fertilizer

soil consists essentially of calcium carbonate which in ages past was deposited from sea water. The conditions prevailing then and those prevailing now have not permitted the deposition or accumulation of manganese to take place in the soil in more than traces, hence a soil deficient in manganese has developed. The use of mineral fertilizers alone, even in very large applications, does not give the desired results; and it is well known by the growers of tomatoes in these sections (more than 10,000 acres are involved) that manure which is obtained from far-away points in the Mississippi Valley and elsewhere is absolutely necessary in addition to the ordinary fertilizer salts. The reason is now very plain. The manure contains manganese. This manganese was taken up by the plants and grain which grew on the soils of these other regions where manganese is more plentiful

Manganese Requirements of Tomatoes

Carefully controlled experiments in the greenhouse and field show that the tomato plants without manganese grow poorly. The leaves become chlorotic—that is, they turn pale green and whitish spots appear on them—and the blossoms and fruit are scarce or absent, even when an abundance of fertilizer is used. The use of small quantities of manganese (as little as 50 pounds per acre in the form of manganese sulphate) causes the leaves to assume a green healthy color, and an abundance of blossoms and fruit results.

Figure 142 shows plants from controlled greenhouse experiments, which have not and which have received manganese. Similar results were obtained in the field. Where manganese sulphate was applied with the ordinary fertilizers the increase, in some places, amounted to about 200 crates of tomatoes per acre, an increase of about 60 per cent. This illustrates the difference between failure and success in tomato growing.

This is an illustration of the application of the results of research to the problems of the practical grower. No doubt many other problems regarding equally mysterious failures of crops could be solved by the application of this new knowledge.

OSWALD SCHREINER.

MANGO of the Carabao Variety Brought from Philippines is Promising

The increasing interest in the mango as a subtropical fruit of excellent quality makes the introduction of promising new varieties of special interest. The Carabao mango is a comparatively recent introduction, which has qualities that should make it of unusual interest to the mango grower and plant breeder. It was first introuced into the United States from the Philippine Islands in 1909 by the United States Department of Agriculture, through Donald MacIntyre, of the Moanalua Gardens, Honolulu, Hawaii. Its original habitat or home is not known, but it probably was introduced into the Philippines from Cochin China. The variety reproduces fairly true from seed, and most of the trees in the Philippines are seedlings. Both vegetatively propagated and seedling trees have been introduced into the United States. The tree of the Carabao variety can be distinguished from that of other varieties by the more open growth of the top, the lighter color of the young foliage, which is pale mahogany, and the prominent venation of the leaves. The fruit also is quite distinctive.

In southern Florida the Carabao has done well on its own roots. On East Indian and other stocks it has not done so well. It is much more resistant to anthracnose than other varieties grown in the United States and in this respect is especially noteworthy. The fruit is elongated, irregularly oval, and of a deep yellow color, which gives it somewhat the appearance of a short, thick banana. (Fig. 143.) In length it varies from 4 to 5 inches. The usual range of weight is from 8 to 12 ounces. In well-ripened fruits the flesh is of a soft, buttery consistency, with little or no fiber. By reason of its flat seed, the fruit can be halved and served after the manner of muskmelon with little difficulty. In quality the Carabao ranks as

one of the best of mango varieties. While the season of maturing varies somewhat, the fruit usually ripens from the middle of June until the middle of August in southern Florida.

FIG. 143 —A fruit and seed of the Carabao mango

The Carabao probably will do well on any soil suited to other varieties of mangoes. In the limy soils of the eastern coast of southern Florida it seems to be better adapted than the East Indian varieties. The disease-resistant quality of this variety, together with its other good qualities, makes it of special interest for crossing with varieties such as the Haden and Mulgoba, which are much more highly colored.

At the present time there is no commercial orchard planting of this variety, although it is available through several commercial growers of nursery stock.

ROLAND MCKEE.

MEAT Animals Judged at Stockyards from Consumer's Viewpoint

The average meat consumer has little knowledge of the origin of the meat he eats. Usually he is satisfied to know that it has been properly inspected and handled under sanitary conditions. If he is an urban dweller he may remember the restaurant at which he got a particularly thick, juicy steak, or the one at which he had a steak that resembled a piece of a rubber boot. If he lives in a small town he may make a mental note regarding the shop where his wife bought an especially fine roast or the one which was like a bundle of dried cornstalks. Beyond such perfunctory interest the average meat consumer does not go. Yet some appreciation of the forces which combine to make the steak or roast what it is is essential if the consumer is to obtain full value for his meat dollar or a reasonable degree of satisfaction from his meat consumption.

Fortunately, many agencies, both governmental and private, and a small army of individuals are devoting their energies to discovering the wants and needs of the meat consumer and to supplying them as nearly as circumstances permit. The wise stockman keeps his eye constantly focused on consumer preferences. He selects and breeds the kind, breed, and type of animals which give promise of producing meat which will be acceptable to the consumer. Later he feeds his animals on such things and to such weights as to produce the quality and size of cuts which will meet consumer requirements. And he markets his animals at such times and in such numbers as will most nearly match the meat consumer's needs.

Consumer's Preference Studied

But it is after the livestock reaches the stockyards that the consumer really has his innings. It is here that his steak, chop, or roast is really selected. Up to this point the meat consumer has been considered as a composite. From now on, he takes on an individuality which is recognized and catered to by everyone about the stockyards. Packers and slaughterers employ expert, high-salaried buyers who make their selections with great care and a high degree of skill. The commission firms maintain corps of salesmen who are expert judges of livestock. The stockyards company provides acres of pens, miles of alleys, many barns and scales, together with hundreds of employees. And finally, the Government contributes a corps of inspectors and market reporters and a system for classifying and grading any meat animal or carcass which may be offered.

FIG 144 —Selecting steaks in the stockyards

This vast machinery has for its main object the interpretation of consumer needs. Here cattle are not bought merely as cattle but as steaks and roasts of a given class, weight, and grade. On the range or farm a lamb may rank high in growth and development, but in the stockyards he must figuratively shed his fleece and stand before the world as chops and legs, and it is by no means certain that the lamb which shows the greatest development in those parts will bring the highest price, for consumer preferences are not limited to quality but include size of portions.

The packer representative does not go into the stockyards to buy cattle, but to buy beef (fig. 144); not hogs, but loins, shoulders, hams, and lard; and not sheep and lambs as such, but rather as chops and legs and breasts. Discrimination is keen; specifications are exacting and rigidly enforced. A slaughterer may buy yearling cattle but refuse to look at 2-year-olds; he may pay the top market price for hogs weighing 190 pounds, but ignore those weighing 20 pounds more. Frequently he will eagerly accept a 78-pound, choice grade lamb,

but will as promptly reject a lamb of equal grade weighing 85 pounds. Why? Because the consumers for whom he is buying at the moment demand so-called "baby beef," lightweight pork loins and a 6-pound leg of lamb. To-morrow he may buy meat for a different set of consumers and will purchase animals of different age, weight, and grade.

Wants of Different Markets

To-day he is buying for the Boston market, where 800 or 900 pound carcasses are preferred, because much of the beef is boned out and the consumer wants heavy steaks and roasts. To-morrow he may be filling an order for New York, where 500 to 600 pound carcasses are required, because the average consumer wants small, tender cuts with relatively little fat.

The necessity for thus selecting the cuts on the stockyards is apparent, for unless an animal of the right age, weight, class, and grade is selected the carcass resulting from its slaughter will be deficient in some respect and the consumer will be unable to get the kind of steak or roast he wants. This is a situation largely outside the control of the retail meat dealer.

Recognizing the importance of these stockyards selections, the Bureau of Agricultural Economics has set up definite standards for most of the important market groups of livestock and meat carcasses, and these are uniformly applied at all markets. The bureau also maintains a market-reporting service at most of the leading livestock markets and meat-consuming centers. The purpose is to simplify and expedite trade by providing fixed and authoritative units of measurement and a common trade language by means of which every one from producer to consumer can describe his products and express his preferences.

C. E. Gibbons.

MEAT Color Fixatives Give Familiar Color to Cooked Cured Meat

When a piece of fresh meat is cooked, one of the characteristic changes is the disappearance of the red color. This is due to the fact that hemoglobin, the red coloring matter of meat and blood, is so altered by the heat of cooking as to lose its color. Cured meat does not, as a rule, lose its red color, because the curing process generally involves the use of an agent which converts the hemoglobin into a stable, red compound which does not lose its color in cooking. Use of color fixatives is so common that the persistence of the red color passes without notice as one of the normal characters of cured meat. Nevertheless the familiar red color of cooked cured meat is an unnatural one and is produced by artificial means.

Comparison of Color-Fixing Agents

Three agents are commonly used for color fixation—namely, saltpeter (potassium nitrate), sodium nitrate, and sodium nitrite. The difference between sodium nitrate (chemical formula $NaNO_3$), and sodium nitrite (chemical formula $NaNO_2$), is noteworthy. Both of these salts are compounds of sodium, nitrogen, and oxygen and differ from each other in the proportions of these elements. This difference

is clearly expressed in the chemical formula which means that a molecule of the one consists of 1 atom of sodium, 1 of nitrogen, and 3 of oxygen, and a molecule of the other of 1 atom of sodium, 1 of nitrogen, and 2 of oxygen. In the names of the two compounds the difference is expressed by the terminations "ite" and "ate." As the two compounds differ in chemical and physiological properties, care must be taken to distinguish between them

The use of saltpeter is old and has been practiced for hundreds of years. Sodium nitrate and sodium nitrite have been introduced within recent years through modern scientific investigation

Scientific investigation first disclosed the function of saltpeter and its mode of action. Saltpeter is first converted through bacterial action into potassium nitrite This compound next combines with the hemoglobin of the meat to form a stable, red compound known as nitrosohemoglobin. The familiar red color of cured meat is due to nitrosohemoglobin.

Value of Sodium Nitrate Recognized

Since sodium nitrate undergoes a similar change into sodium nitrite, the possibility of substituting it for the more expensive potassium salt became apparent. Thorough investigation having shown that the substitution could be effected without impairing the quality or wholesomeness of the meat, the use of sodium nitrate in establishments operating under Federal meat inspection was formally sanctioned by the Department of Agriculture in September, 1914. Owing to the acute shortage of potash salts brought about by the outbreak of the World War, the admission of sodium nitrate came at a most opportune time, and its adoption by the meat-packing industry was immediate and almost complete.

Since color fixation is actually accomplished by the nitrites, the nitrates being employed merely as sources of nitrite, the next logical step in advance was the introduction of sodium nitrite as a color fixative. Experiments showed that sodium nitrite could not only be used successfully but that in commercial meat curing its use is attended with certain material advantages. The chief of these is that the curing period may be shortened by using it. The formation of potassium or sodium nitrite from saltpeter or sodium nitrate by bacterial action naturally requires time, so that color fixation does not begin immediately when these salts are used. On this account color fixation is not always completed by the time the meat has taken up the quantity of salt desired.

Large Use Follows Authority to Use Nitrite

When sodium nitrite is used, color fixation begins at once and is completed by the time sufficient salt has been absorbed by the meat. This makes possible a shortening of the usual curing periods. Use of sodium nitrite also tends to eliminate uncertainty and failures in curing and makes for reliability and uniformity of product. Thorough investigation having shown that its use under proper control is not attended with danger to human health and that the quality and food value of the meat are in no way impaired on account of its use, use of sodium nitrite in establishments operating under Federal

meat inspection was formally authorized by the Department of Agriculture in October, 1925. Its use in commercial meat-packing establishments is now widespread.

Of the three color-fixing agents in common use, only saltpeter and sodium nitrate are recommended for home curing. These two are identical in action but differ in potency, 4 ounces of sodium nitrate being equivalent to 5 ounces of saltpeter. Sodium nitrite is not recommended for home curing, as it has chemical and physiological properties which make it dangerous unless properly handled. Its advantages are not material when applied to small-scale operations and are far outweighed by the extra care, precise weighing, and accurate control required to use it with success.

Benefit to Livestock Industry

Because sodium nitrite is not a suitable substance for use in home meat curing, it must not be supposed, however, that its introduction into commercial curing is a matter of no importance to the farmer. On the contrary, it is of material although indirect benefit. Tending as it does to remove uncertainty and guesswork from one of the important steps in the preparation of meat for consumption, its benefits are bound to be reflected in stability of livestock prices. The scientific study of meat-curing agents, in which department scientists have taken a prominent part, has therefore resulted in real and permanent benefit.

Robert H. Kerr.

MEATS Condemned by Inspectors Disposed of Under Supervision

The disposal of meat and meat food products condemned by the inspectors in the meat-inspection service of the Bureau of Animal Industry is an interesting and most important feature of the work. Such products are kept under strict control of the meat-inspection force from the time they are condemned until they are made unsuitable for food purposes. The accomplishment of this duty in an efficient manner to satisfy the requirements of the law places a task on the service which requires constant vigilance.

Requirements of the Law

The law requires that all carcasses and parts of cattle, sheep, swine, and goats, and the meat and meat food products thereof, found to be unsound or otherwise unfit for human food shall be marked "Inspected and condemned" and destroyed for food purposes by the establishment under the supervision of an inspector of the Department of Agriculture. The regulations governing the inspection specify precise methods for disposing of the condemned meat.

The condemned product is treated in steam or dry rendering tanks for reduction to inedible grease and fertilizer. After it has been placed in a tank and the necessary quantity of a denaturing substance added, the tank is securely sealed by an inspector with Government seals, serially numbered, which are supplied for that purpose. The numbers of these seals are recorded by the inspector at the time the

seals are affixed. When the seals are broken, each number thereof must agree with the inspector's record. Being of a brittle nature, the seal can not be removed or tampered with unless it is broken.

Consumer is Amply Protected

When the product has been processed for a sufficient length of time to insure its being effectually destroyed for food purposes—and inspectors in the meat-inspection service are especially competent to determine this on account of their training and experience—the seal is broken by an inspector. At establishments having no tanking facilities the condemned meat is destroyed either by incineration or by freely slashing it with a knife and applying crude carbolic acid. Special reports are kept by the inspectors condemning the product and by those supervising its disposition in order that, by carefully checking these against each other, strict control of the condemned product may be maintained.

To meet the many problems presented by various plants operating under inspection this function of the service requires considerable study. The special nature of each establishment in connection with its system of operation, the kind of meat it handles, and the grade of product it produces, influence to a large extent the manner in which arrangements are made to handle the condemned product in conformity with the law. The consumer, however, may rest assured that the methods in operation and the precautions taken in the disposal of condemned meat are a guaranty that he is protected against the use of any such product when he buys meat bearing the mark "U. S. inspected and passed."

A. J. Pistor.

MEAT Cooking Need Not Be Guesswork If Thermometer Is Used When the meat roast comes on the table there is often an anxious moment before it is carved. Will it be rare, medium, or well done, to just the stage the family likes? More often than not a wave of disappointment runs around the table, and the cook reproaches herself for not guessing better. For roasting meat without a knowledge of the temperature in the center is guesswork at best. A simple way to avoid it is to place a thermometer in the roast before it is put into the oven. Then the mercury column tells when the meat is "done" to the desired stage. When the temperature at the center of a rib roast of beef reaches between 55° and 65° C., or 131° and 149° F., the meat is rare; between 65° and 70° C., or 149° and 158° F., the meat is medium well done; and between 70° and 80° C., or 158° and 176° F., it is well done. The temperature continues to rise several degrees after the roast is removed from the oven, and this should be allowed for if the roast is to stand a while before it is served.

Beef is not the only meat for which a thermometer is useful. Leg of lamb, leg and loin of veal, loin of pork, ham, fresh or cured, roasted or boiled—all these cuts are satisfactorily cooked when the temperature reaches 75° to 80° C., or 167° to 176° F.

The meat thermometer also helps to prevent overcooking. Too much cooking destroys delicious flavors in meat, causes great shrink-

age in size and in weight, and detracts from its appearance. Many persons who are accustomed to overcooked meat do not know how much more palatable it is when cooked just enough and no more. Cooked to the medium and to the rare stages, the flavor is much more delicious and the meat is much juicier than when it is well done.

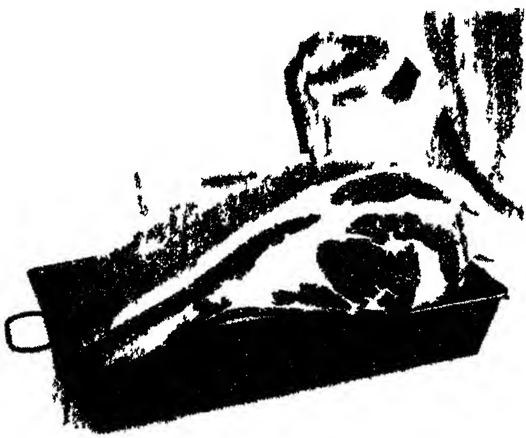

FIG. 145.—A meat thermometer inserted into the center of a roast before it is put into the oven makes it possible to tell when the meat reaches the desired stage of rare, medium, or well done

By using an oven thermometer in addition to the one inserted in the meat it is soon possible to learn how many minutes need be allowed to the pound for a certain cut to reach the desired stage.

The use of a meat thermometer is not new, and there seems to be no reason to prevent its wide adoption in the household. Grindley, Sprague, Bevier, and others associated with them at the University of Illinois used thermometers in beef roasts 25 years ago. The temperatures given above are adapted from them. Thermometers such as the one shown in Figure 145 are being used in the standard cooking of meats for palatability tests in the Bureau of Home Economics and other laboratories.

LUCY ALEXANDER.

MEAT CUTS Differ Much in Composition and in Food Value If every piece of meat in the market had the same proportion of lean, fat, and bone, it would be a fairly simple matter for a housekeeper to decide which cuts are the most economical. The price per pound of a particular cut would then be a very good indication of its cost as compared with other cuts of similar nutritive value. But since no two pieces are alike in their physical composition the prospective purchaser who has to get the most nutriment for her money must reckon how much will be thrown away as bone or gristle and how much will go into the jar of cooking fat.

The most casual observer realizes that meats as bought are extremely variable in the fat content of their edible portion as well as in their bone content. It is fairly plain, too, that the cuts that are highest in visible fat will contain the most fat as determined chemically, by extraction with ether, and that they would be highest in value as an energy food, since a gram of fat yields more than twice as many calories as a gram of protein. Considered as a source of available fuel, then, there is no similarity between a thin round of beef, the edible portion of which contains about 8 per cent visible fat, and a fat shoulder of pork with about 39 per cent visible fat in its edible portion. The beef round would yield 680 calories

and the pork shoulder 2,090 calories per pound of edible material, if none of the fat should be wasted. This counts all of the fat in the wholesale cut with no allowances for loss of fat at the market, in the kitchen, or on the table. A comparison of meats as they are actually eaten would of course be less striking in this respect.

With such wide variation in fat content it is not surprising that meats differ considerably in their content of protein, and from a nutritive standpoint this constituent is of primary importance. The thin round of beef, for example, has more than one and one-half times as much protein as the fat pork shoulder.

All Cuts Much Alike in One Way

A study of the proportions of lean meat, visible fat, and bone in beef, lamb, and pork has been made in the Bureau of Home Economics in connection with a study on the chemical composition and fuel value of foods. This work has shown that while there are very wide differences in the physical make-up of meats of different kinds, grades, and cuts, there is one way in which they are all very much alike. This is in what is called the "fat-free" substance of the edible portion.

The edible portion consists of fat, water, protein, and ash. The last three of these make up the so-called "fat-free" substance. This is the part that would be left if all of the fat were removed chemically from the edible portion; and in all of the fresh meats studied the fat-free material was very similar. In practically all cases 76 to 78 per cent of this part was water, 21 to 23 per cent was protein and 1 to 1.2 per cent ash.

A cut of meat containing 10 per cent fat (as ether extract) in its edible portion has 90 per cent fat free and on the average about 19 per cent protein and 1 per cent ash; one that contains 25 per cent fat has about 16 per cent protein and 0.8 per cent ash; and a cut with 40 per cent fat has about 13 per cent protein and 0.7 per cent ash. As approximations, these figures can be applied alike to beef, pork, or lamb, regardless of grade or cut.

Data, on the composition of certain wholesale cuts of meat of various grades are shown in Tables 11, 12, and 13. The first two illustrate differences in the proportions of lean, fat, and bone in the meat as it is purchased and in the contents of the edible portion. The last shows how the same cuts that are not at all alike in composition when compared on the usual basis are almost uniform in the water, protein, and ash content of the "fat-free" substance.

TABLE 11.—*Physical composition of meat in percentages as purchased*

Description of meat	Bone	Skin	Fat	Lean	Edible
Beef, fresh, wholesale cuts:	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Round, thin, common grade	12	----	7	81	88
Round, very fat, choice or prime grade	9	----	20	71	91
Hind shank, medium fat, medium grade	59	----	5	36	41
Loin, fat, good grade	12	----	26	62	88
Pork, fresh, wholesale cuts:					
Ham, thin	13	5	15	67	82
New York shoulder, fat	6	4	35	55	90
Lamb, fresh, wholesale cuts:					
Stew (breast), thin, medium or common grade	29	----	20	51	71
Leg, fat, choice grade	13	----	17	70	87

TABLE 12.—*Content of visible fat and chemical composition of meat in percentages of edible portion*

Description of meat	Visible fat	Water	Protein	Fat	Ash	Calories
Beef, fresh, wholesale cuts:	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	
Round, thin, common grade	8	71	19.7	8	1.00	680
Round, very fat, choice or prime grade	22	58	17.4	24	.82	1,300
Hind shank, medium fat, medium grade	12	69	20.1	10	.93	770
Loin, fat, good grade	30	53	15.6	31	.77	1,550
Pork, fresh, wholesale cuts:						
Ham, thin	18	60	17.2	22	.90	1,210
New York shoulder, fat	39	42	11.6	46	.63	2,090
Lamb, fresh, wholesale cuts:						
Stew (breast), thin, medium or common grade	28	61	16.5	22	.86	1,200
Leg, fat, choice grade	19	62	17.1	20	.90	1,130

TABLE 13.—*Percentage of fat-free substance in meat and its chemical composition*

Description of meat	Fat-free edible	In fat-free substance		
		Water	Protein	Ash
Beef, fresh, wholesale cuts:	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Round, thin, common grade	92	77	21.4	1.09
Round, very fat, choice or prime grade	76	76	22.9	1.08
Hind shank, medium fat, medium grade	90	77	22.3	1.03
Loin, fat, good grade	69	77	22.6	1.12
Pork, fresh, wholesale cuts:				
Ham, thin	78	77	22.1	1.15
New York shoulder, fat	54	78	21.5	1.17
Lamb, fresh, wholesale cuts:				
Stew (breast), thin, medium or common grade	78	78	21.2	1.10
Leg, fat, choice grade	80	78	21.4	1.12

The study has brought together and summarized the results of research from the laboratories of numerous Federal and State institutions and will be useful to persons interested in the scientific side of animal production and in the meat industry as well as to those who are concerned with problems in human nutrition.

CHARLOTTE CHATFIELD.

MEAT Grading by Official Standards Benefits Producers

Many consumers find it very difficult to judge quality in uncooked meat, and in the absence of uniform grades they have no standards to guide them. Because of this the meat from the higher-grade animals is generally sold at a disadvantage and in many cases comes in direct competition with meat from low-grade animals. In a large measure they have to compete in the markets with meats and meat products that have a much lower relative value. This reacts to the disadvantage of both consumers and producers. The dealers suffer too in the long run, since general dissatisfaction with quality and price is likely to affect the volume of purchases and consumption.

To meet this situation and as a further step in its standardization program, the Bureau of Agricultural Economics has now worked out standards for meat, some of which have been made official standards through promulgation by the Secretary of Agriculture. The other standards for meats are as yet tentative in character, but

are being tried out under commercial conditions and used in the market news service.

Recent experiments in grading certain meats and branding them according to grade have shown the benefits to be derived from such a system. Both retailers and consumers have expressed great satisfaction with the system and with results and there have been many requests that the practice be extended.

The practice of grading meats benefits producers, too, although these benefits are not as obvious as are those enjoyed by the retailers who have seen their trade increased or by the consumers who have felt that they obtained just the quality of meat expected for the money they spent. This satisfaction tends to increase consumption, which in itself should eventually benefit producers. It creates a better feeling in the trade, which is worth while to all elements in the industry.

Heretofore to a large extent the products of beef cattle have had to compete with beef from dairy cows. Dairy cows generally are not slaughtered until after they cease to be profitable milk producers and have therefore passed the maximum age limits of animals that produce the better grades of beef. When consumers can not judge of quality, this competition is unfair, but once this system of grading and selling by grade has become established consumers will have a guarantee of quality, and products can then be sold for exactly what they are. The possibility of misrepresentation will be practically eliminated As a result the producer of choice-grade animals will receive a price that at least justifies the production of choice-grade animals; the producer of good-grade animals will receive a price that justifies the production of good-grade animals, and so on through all the lower grades.

Uniform Grading Necessary

Misrepresentation in the sale of meats is of vital consequence to livestock producers Stability and permanency of operation are dependent upon its elimination. Uniform grading of livestock products seems the only answer. In this respect official grading according to official standards has a distinct advantage, for no single or selfish interest is involved and no outside influence is permitted. All decisions are unbiased and are based on inherent factors contained within the product. It tends toward more uniform price relationships between grades of the various classes. It enables producers of livestock to operate on a more satisfactory basis because it tends to remove some of the guess from marketing problems. In a word meat grading tends toward greater stability in livestock production and distribution.

An illustration of the possible effect of meat grading on livestock prices is found in a study of market trends on better grades of cattle during the six month's period beginning May 2, 1927, when the Government beef-stamping experiment was first inaugurated. Conditions were all favorable to producers and marked fluctuations in prices did not occur. As a consequence of the experiment and accompanying economic conditions, producers of better grades of cattle enjoyed a season of prosperity which has no parallel within the last decade.

W. C. Davis.

MEAT Inspection Is Advanced by Use of Improved Equipment Considerable advancement has been made in the United States in the development and use of equipment that facilitates the inspection and sanitary handling of meat at establishments which operate under the Federal meat-inspection law. The law and supplementary regulations place emphasis on the maintenance of good sanitation. To bring about suitable conditions, there has been a need to reform many age-old practices and devise equipment and methods which insure the clean preparation of animal carcasses and edible products derived from them.

A Challenge to Inventive Genius

The demands for improving the old-time methods formed a challenge to the capacity and talent of the packing industry and the ability of Government inspectors who apply the provisions of the law. This challenge has been ably met. The modernization of establishments has brought about enormous saving of meats by preventing deterioration. With this advancement there has been an application of modern principles of sanitation, hygiene, and allied sciences leading to the desired goal—a supply of wholesome meat for consumers.

Marked advancement has been made in designing and developing mechanical devices to facilitate the slaughter and inspection of the large number of animals received. There has been improvement, likewise, in methods of handling the carcasses and parts. The requirement that hog carcasses, including the head and feet, shall be free from hair, scurf, and dirt before incisions are made for evisceration or inspection has been instrumental in developing highly specialized machinery to dehair and clean the carcasses. Some of these machines have a capacity of 600 or more hogs an hour.

Moving chains installed close to the overhead-carrier rails and adapted for conveying the suspended carcasses of hogs, cattle, calves, and sheep from point to point during the various stages of preparation and inspection are in common use.

Moving-top Tables Aid Inspection

One outstanding feature is the development of moving-top, viscera-inspection tables. These tables (fig. 146) are of various designs but all serve the same purpose, that of providing means for the sanitary handling of edible viscera and facilitating their inspection. The tables are constructed wholly of metal and vary in length from a few feet to 60 or more feet, according to the needs. They are provided with a continuous series of large, shallow pans or closely fitted "flights" or slats which provide separate compartments, as illustrated. The pans or flights are fastened to sprocket chains which convey them over the top of the equipment horizontally and return them by passage underneath. The rate of travel of the pans or flights is synchronized to the movement of the carrier chain, which conveys the suspended carcasses in a line parallel with and close to the moving-top table. As the suspended carcasses come to the "eviscerator," this employee removes the internal organs and places them on

the moving-top table opposite the carcass, each set of organs being allowed sufficient space to prevent contact with other sets. In this manner the identity of viscera with the carcass to which it belongs is definitely maintained until its inspection is completed as it passes along the length of the table

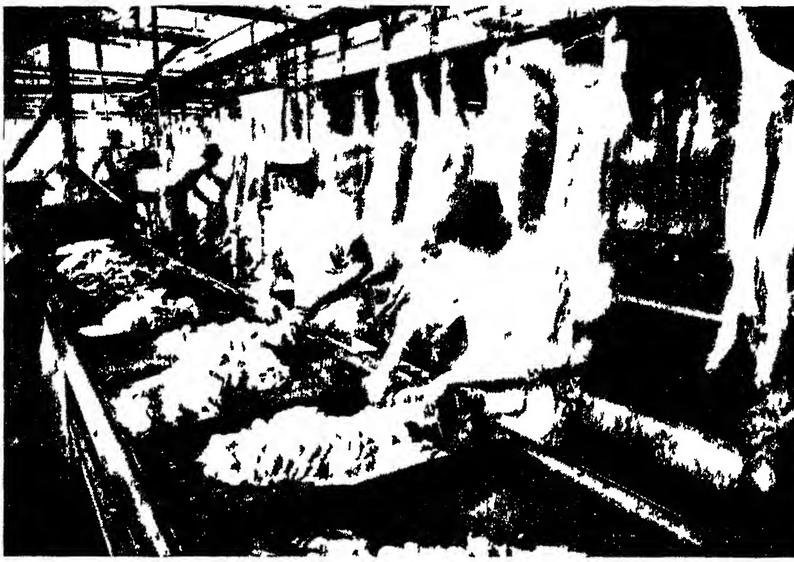

FIG. 146.—Sanitary moving-top table with Government inspectors examining internal organs of hogs. Separate compartments are provided for each set of organs. The carcasses are passed along on a conveyor rail at the same rate of speed as the table top to insure complete identity of viscera with carcass.

Sanitary Equipment and Clean Practices Required

Organs and parts inspected and condemned, after appropriate tagging and branding, are automatically discharged over the end of the table into specially arranged equipment preparatory to being rendered unfit for food. Organs passed as fit for food are removed at the side of the table. In the passage of the inverted pans or flights on the underside of the table they are automatically subjected to a cleansing and sterilizing process so that the receptacles are returned to the upper side clean on all surfaces. Modern lavatory facilities for operatives and inspectors and places for cleansing and sterilizing knives, saws, cleavers, and other implements are provided at convenient points about the table and elsewhere.

In departments of establishments where comparatively small numbers of animals are slaughtered, all viscera on removal from the carcass are placed for inspection, one set at a time, either on small, stationary tables made of impervious material and provided with removable, shallow tops, or in specially constructed metal trucks. This method prevents contact of diseased and healthy sets of organs and provides ready and efficient means for disinfecting the table top or truck.

Specially designed sanitary equipment is provided for holding—meanwhile maintaining complete identity with the carcass—all edible parts, such as heads and caul fat severed in the process of dress-

ing, until the inspector has completed the examination of the carcass and all its parts and viscera. Wooden equipment has largely given place to equipment of impervious character in all departments of meat-packing houses. A rigidly enforced rule is that meat and products shall not be subjected to unclean conditions.

E. C. Joss.

MEAT Problems Yield to Studies by State and Federal Workers

Quoted below are pertinent portions of a letter addressed in October, 1927, by a beef packer to a shipper; the letter was subsequently called to the attention of Department of Agriculture specialists interested in the subject:

> In reference to the load of * * * cattle we bought * * * would say that we are sorry to report that 30 cattle out of the 44 cut black. By that we mean not dark but black, so much so this beef will have to be sold at a loss to us of at least 4 to 5 cents per pound.
>
> The object of our letter is not to complain about this but to call this condition to your attention to see if something can not be done to avoid this dark-cutting beef.

While this particular complaint was found to be greatly exaggerated, it is with such problems as this and others of possibly greater importance, listed for solution, that 23 State agricultural experiment stations and the United States Department of Agriculture have begun a cooperative study of the factors which influence the quality and palatability of meat.

The investigators are not entirely concerned at the beginning with the merits of the case. They are accepting as justifiable the well-formed prejudice which exists against dark-cutting beef as well as other trade discriminations found in various sections of the country.

True, they intend to ferret out these prejudices and separate those which are based upon significant facts from those which are mere superstitions. They are in fact engaged at the present time in attempts to perfect standards of measurement of quality in meats. But the foremost consideration is to learn for the producer the most practicable and efficient methods of producing the quality of meat which the market desires and is willing to pay for. Beef seems to offer the most challenges to present knowledge, and it is, therefore, receiving special emphasis at the start. However, lamb and pork are receiving due attention.

Producer Needs Research Assistance

When a stockman breeds or buys a bunch of good-quality calves and places them in the feed lot he expects to receive payment for his pains. The breeder of these calves has gone to the expense of mating high-grade or purebred cows to a thick, blocky sire, placing his faith in the laws of heredity.

When this stockman feeds and fattens these animals according to the approved, modern methods of the utilization of home-grown feeds and pasture, properly supplemented with proteins, minerals, and good, pure water, he feels that he has a still stronger claim on a profit for the enterprise.

But when, in spite of all this careful husbandry, his cattle cut dark, or his neighbor's cattle, which have been equally well treated, cut dark and suffer a price discrimination or bring the threat of such treatment against an entire beef-producing section, then this stockman has sufficient cause for calling for help from the research institutions which he supports by State and Federal taxes.

The matter of dark-cutting beef has been cited merely as a concrete example of many questions needing solution. The question of the proper method of producing the highest-quality carcass on grass, with proper supplementing feeds that will not nullify the great advantage of grass—its cheapness—is even a more important problem because it pertains to such large sections of the country.

These and other factors which make for quality in meats are being studied. Instead of attacking the many ramifications of the problem in a haphazard fashion, the work is being correlated and a program

FIG. 147.—Here are shown two beef ribs whose histories are known, from the feeder animals to the cooked rib roasts. As feeder cattle, the steer which produced rib B was superior to the other. After being fattened on different rations A scored higher as a finished carcass and as cooked meat than B. This shows the influence of feed on quality in meats

is being mapped out to prevent unnecessary duplication and to promote unified progress. Feed-lot practices have been standardized so as to make possible true comparisons of animals with respect to sex, age, breeding, grain feeding, grass feeding, and so on. An official committee scores each animal as a feeder, when finished, and as a carcass. Complete slaughter records are combined with feeding records. (Figs. 147 and 148.)

Lastly, the meat from these animals is actually measured as to quality. The color, tenderness, chemical composition, and muscle structure are recorded and compared. Samples are cooked by uniform methods and graded for palatability by another group of persons.

More than 1,000 cattle were fed in accordance with this program last year. Ribs from 63 representative head were sent to the Government laboratories for a complete test as to quality. Eleven hundred hogs and more than 400 lambs also were studied with respect to quality in the product.

Uncertainty Hampers Industry

Any uncertainty that may exist in the mind of a buyer of the stockman's product as to whether it will produce the quality of meat which he thinks it will, and which the consumer is demanding, has an unfavorable effect on the profits of the producer. It is this uncertainty which must be removed. The buyer knows by looking at the animal on foot what its hide is worth. It will weigh just about so much, and when properly tanned will make a pretty definite number of shoes or aviators' helmets or footballs. Its value is not hidden in mystery. The by-products of its manufacture will produce a certain, definite value of hide, tankage, fertilizer, glue, hair, soap, and so on. But the quality and value of the meat of the animal—of more importance by far than all the other products combined—can not be definitely known until later. Even when the carcass is chilling on the rail in the cooler, one can not tell. A meat expert

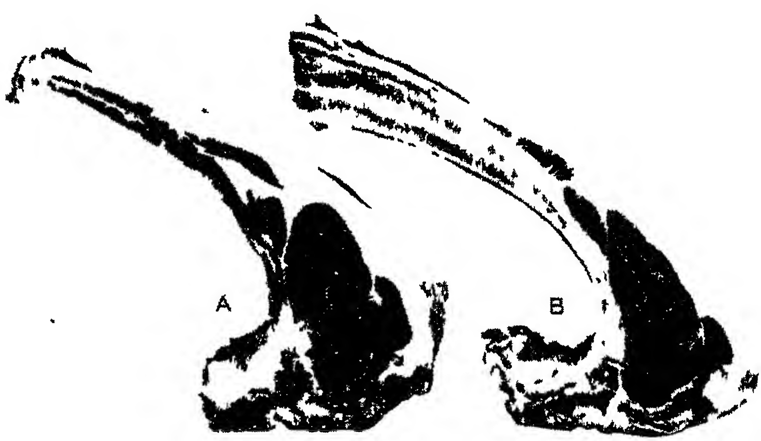

FIG. 148.—According to the best-known methods of measuring worth in feeder cattle, the cattle which furnished ribs A and B started on approximately an equal basis. Following a radical difference in feeding, a marked difference in carcass was found, A being superior. The decision of the judges of the cooked meats substantiated the carcass scoring. Here again feed evidently was a potent factor

may have some well-formed ideas, but they have now and again been disproved. Not even when the meat is cut and sold as a steak or roast to the consumer can the final and all-important verdict be rendered. Not until the knife and fork and the palate have had their say is the matter decided. "And that is too late for the best interests of the industry," says the producer.

E. W. SHEETS.

MEAT Production and Consumption in United States

Estimates of meat production and consumption in the United States, based on the Federally inspected slaughter, have been published annually by the Bureau of Animal Industry since 1907, that being the first year the inspection service operated on its present scale. Many requests have been received for figures dating earlier than 1907, and this article carries the data back to 1900, thus showing the trend for

the 28-year period from 1900 to 1927, inclusive. The earlier estimates were compiled with the cooperation of C. L. Harlan and other specialists of the Bureau of Agricultural Economics.

The data are presented graphically by means of charts for each kind of meat and for all meats combined. Pork and lard are treated separately, and the consumption in every case is shown both in total and per capita form. The charts contain also the exact figures for the various items each year, taking the place of tables in the text

Scope of the Data

It is fairly well known that the Federal meat inspection does not cover the entire slaughter of the country, since it is compulsory only for meat offered in interstate or foreign trade. In recent times it has covered about two-thirds of the total slaughter. Records of the Federal inspection are fully and accurately kept and are published monthly and annually. The remaining slaughter is estimated on an annual basis from census and market data and packers' reports. All the original slaughter records are in the form of animals, and much of the detailed information necessary to convert the animals into meat is ascertained and furnished by the Bureau of Agricultural Economics.

Definition of Meat as Used in This Article

It should be understood that the term meat as here used refers to what is known as "butcher's" meat, that is, the flesh of cattle, sheep, and swine in dressed form. Meat from poultry, game, rabbits, etc., is not considered. Some goats and horses are slaughtered under Federal inspection, but the total production of goat meat is so small as to be negligible, while a large part of the horse meat is exported and the remainder used to feed animals, such as foxes, dogs, and the wild animals in zoological gardens and menageries.

The meat estimated to be produced from each kind of animal is calculated by means of an average weight representing the dressed carcass. Such dressed carcasses do not include the offal, a considerable portion of which is edible—liver, pluck, etc. As an offset to this exclusion, the dressed carcasses themselves contain much waste in the shape of bones and trimmings, so that the figures as presented are approximately the equivalent of the net meat. However, should it be desired to add the edible offal to the various meat totals, the same may be roughly accomplished by adding 8 per cent to beef, 7.3 per cent to veal, 3.8 per cent to lamb and mutton, and 15.7 per cent to pork. The pork percentage is highest because more than one-half of it is derived from the head, hocks, and feet.

All Meats

The data for all meats combined are shown in Figure 149. The totals include a small quantity of goat meat not mentioned separately. Both production and consumption have increased about 5 billion pounds during the period from 1900 to 1927. Approximately this is an increase of 40 per cent for the first quarter of the century. This rate of increase indicates that the task of supplying future

generations with a sufficiency of meat from domestic sources will call for continuous expansion of the industry.

The space between the production and consumption in the various charts represents the exportable surplus. More specifically, this means the net exports after deducting the imports. With few exceptions, however, the annual imports of meat have been of little consequence. The principal exceptions were an importation of 253 million pounds of beef in 1914 and about 100 million pounds of New Zealand lamb in 1920. In the latter case a large part of the consignment was reexported in that and the succeeding year.

It is particularly noticeable that the surplus of meat in recent years is much smaller than it was at the beginning of the period. This is explained by the fact that a large portion of the surplus in the early years consisted of beef, which has since disappeared. During the last

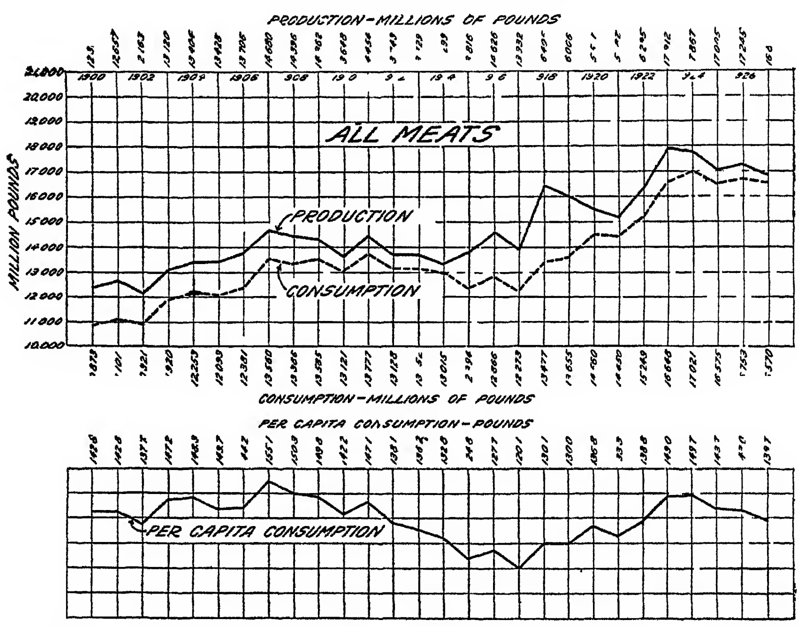

FIG. 149.—Annual production and consumption of all meats, calendar years 1900 to 1927

decade the surplus has been confined to pork. Generally speaking, the peaks in the production curve are due to unusually large supplies of pork. The exception is the sharp peak in 1918, in which beef played a large part in response to the demand for World War supplies.

The per capita consumption curve is chiefly notable for the marked depression during the war period. On the other hand it is also apparent in Figure 149 that the exportable surplus for the same period was the greatest on record.

Beef and Veal

A distinctive feature of the beef chart (fig. 150) is the shaded portion of the production curve. Exports of cattle on the hoof (principally to British ports for immediate conversion into beef) formed a considerable portion of the beef surplus during the first

decade of the present century. Hence it is necessary to show these exports in order to present a true picture of beef production during that period. It is seen in the chart that practically no surplus of beef has existed since 1912, except in the period of the World War. It had, in fact, become unprofitable to produce beef for export against the competition from cheaper sources of supply, notably Argentina.

Postwar developments in the beef-cattle industry indicate the economic hardships experienced by cattlemen. Slaughter figures show a steady increase each year from 1921 to 1926, when the production of beef and veal totaled close to 8½ billion pounds, the greatest in history, and more than 2 billion pounds larger than the total for 1900. This was done, however, at the expense of a severe depletion of the national herd, and the inevitable decline commenced in 1927.

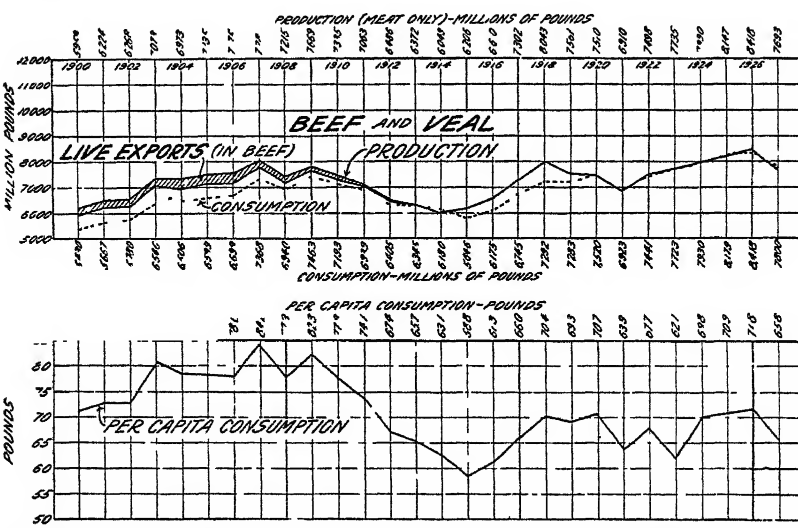

FIG 150—Annual production and consumption of beef and veal, calendar years 1900 to 1927. The shaded portion of the production represents the beef equivalent of cattle exported alive

The per capita curve of beef and veal shows a very rapid decline in the consumption extending from 1909 to 1917. The extremely low point in 1917, however, was the Nation's response to the call for conservation in the crucial food period of the war.

Lamb and Mutton

The production and consumption of lamb and mutton in the United States are of minor significance in comparison with beef and pork. Published figures show the relative consumption to be much below that of most other meat-eating countries. For example, the consumption of lamb and mutton in England and the Australian colonies is, in proportion to other meats, fully five times as large as that of the United States. As might be expected, there is no recordable surplus of lamb and mutton, and since the imports are negligible (excepting the one year, 1920, previously referred to), it is impracticable to chart separate curves for production and consumption.

Figure 151, therefore, shows only the production and per capita consumption. The high peak in production, 779 million pounds, occurred in 1912, and was followed by a rapid decline lasting five years. There has been a steady gain, however, in recent years, and in 1927 the total stood at 654 million pounds, which is about 25 per cent greater than the total for 1900. The present shortage of beef cattle seems to offer a good opportunity for further expansion in the lamb-feeding industry.

The per capita consumption of lamb and mutton, in pounds, as a rule follows rather closely the corresponding figures for total production, in hundreds of millions of pounds (the latter on the left and former on the right side of the chart). Because of the increasing population the line of consumption is well above that of the production in the early part of the period and below it during the latter part. The increased production each year since 1922 has sufficed only to hold the per capita figure about stationary.

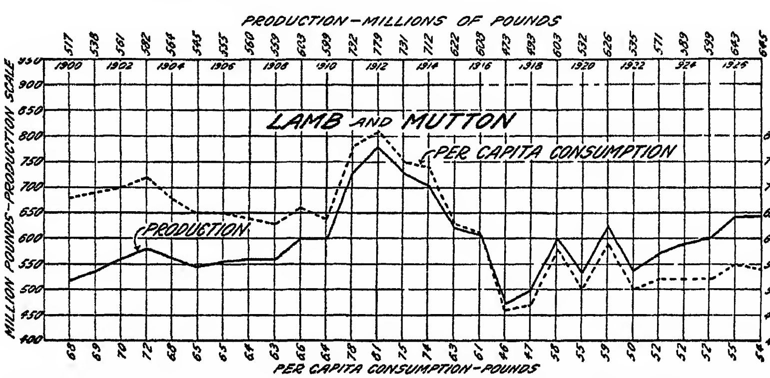

FIG. 151.—Annual production and consumption of lamb and mutton, calendar years 1900 to 1927. (Scale of consumption is on right side of chart)

Pork

The American farmer is a world provider of hog products. He has shown himself able not only to supply the home demands of an ever-increasing population but to produce annually a surplus which goes to the four corners of the earth. The fact that swine can be raised to market age in a few months accounts for the almost illimitable possibilities of expansion within the industry. This is well illustrated by the increased production of more than 2½ billion pounds of pork and lard in the short space of two years from 1921 to 1923. A further example is seen in the high and low points of the production curve in Figure 152. Here one observes a minimum production of 5⅓ billion pounds in 1902 and a maximum of 9½ billion pounds in 1923. Actually this meant that about 32,000,000 more hogs were slaughtered in 1923 than in 1902.

The per capita curve of pork shows irregularities due to the well-known corn and hog cycle which alternates between comparative abundance and scarcity of the product. The enormous production in 1923 and 1924 followed bumper crops of corn, and the absorption of such vast quantities of pork brought about the highest per capita figures ever recorded.

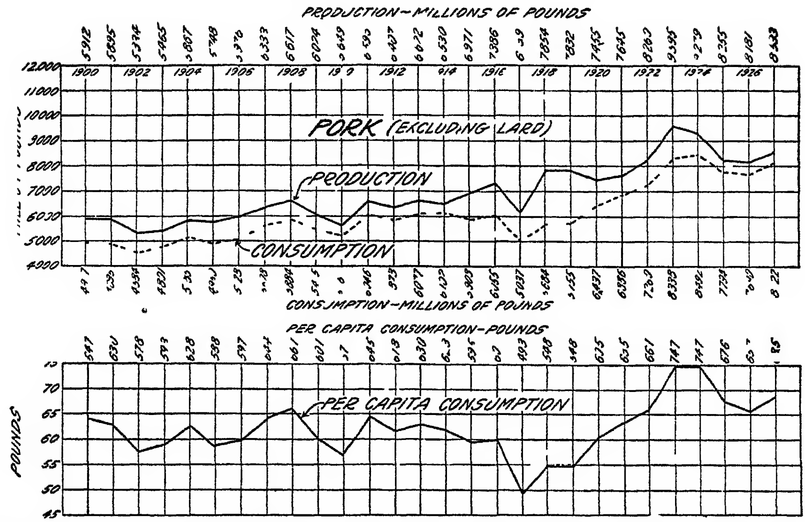

FIG 152 —Annual production and consumption of pork, exclusive of lard, calendar years 1900 to 1927

Lard

Notwithstanding the numerous substitutes, compounds, etc., designed to take its place, lard of swine continues to be an indispensable article of commerce, and American lard dominates the world's markets. The commerce reports show lard to be the largest single item in the exports of animal origin In the latest report shipments are recorded to 87 specified countries in every continent of the globe.

The commercial preparation of such great quantities of lard is a highly developed business which is mostly in the expert hands of the large packing establishments. This centralization of the industry makes for economy and stability in the handling of the entire product.

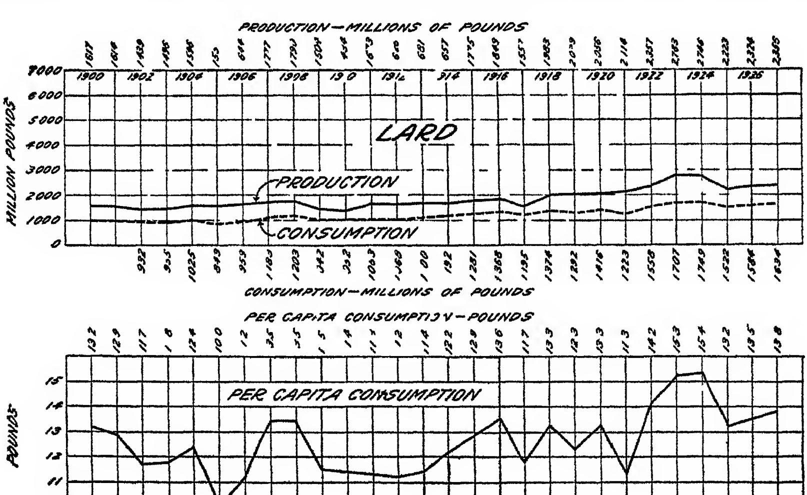

FIG 153 —Annual production and consumption of lard, calendar years 1900 to 1927

Consequently it may be noted that the production and consumption curves in Figure 153 are far more regular than those of the meats. It may be noted, also, that the surplus, or export, is consistently large throughout the whole period.

The per capita consumption of lard as a rule follows closely the corresponding curve for pork. The extreme points range between 10 pounds in 1905, and 15.4 pounds in 1924.

JOHN ROBERTS.

MEAT Reinspection for Government Agencies a Worth-while Safeguard

The Federal meat inspection service of the Bureau of Animal Industry reinspects meat and meat food products for various Government organizations for the purpose of insuring delivery of articles which conform to purchase specifications. As these Government organizations are not in position or equipped to pass upon the merits of these articles of food, inferior products were sometimes delivered to them in the past. Consequently assistance was requested of the Federal meat-inspection service, which maintains expert inspectors in 46 States.

Inspection Covers Many Operations

This cooperation has been in effect for many years with respect to some of the organizations. It consists in determining the kind, cuts, and condition of meat and products and in supervising their handling throughout the various stages of preparation from the time the animals are slaughtered until the products are packed and marked for delivery. This supervision includes the kind and length of cure, such as salting and smoking, and the required temperatures, as well as cutting, grinding, seasoning, cooking, wrapping, packing, labeling, and affixing the special mark of the contracting organization showing that the products meet all the requirements of specifications.

The work is conducted by about 100 inspectors at 30 establishments at which Federal meat inspection is maintained and at 10 other points where the articles are delivered. Only a part of the time of the expert inspectors who are regularly detailed to conduct the Federal meat-inspection service is required to perform this duty. Inspectors at points of delivery, however, devote their full time to the work, which consists in a careful examination of the products at the time of delivery to see that they bear the special mark of the Government organization for which they are intended, and are in good condition.

Extent of the Service Rendered

This cooperative work has resulted in a saving to the Government of many thousands of dollars through assurance that it receives the products purchased.

During the fiscal year 1927 meat and meat food products reinspected for these organizations totaled 68,738,081 pounds, of which 66,981,866 pounds were passed as complying with the purchase specifications, and 1,756,215 pounds were rejected for noncompliance.

WM. H. SMITH, Jr.

MEAT Users Protected by Inspection Marks and Truthful Labels

Do you know that about two-thirds of the meat consumed in this country is prepared under the supervision of the Federal meat-inspection service? The consumer need have little fear in eating meats prepared under the watchful eyes of the 2,500 employees of this great organization. They see and examine all animals on the day they are slaughtered and during the dressing of the carcasses examine every part. (Fig. 151.) During the manufacture of products sausage, hams, bacon, and all the rest the inspectors are in attendance and see that all operations are conducted according to regulations

Fig. 151. Post-mortem inspection of swine in a federally inspected establishment

Chemists Test Products for Purity

The Federal meat-inspection service maintains seven chemical laboratories, located at various points for convenience and prompt action. The chemists in these laboratories are constantly analyzing and testing samples sent to them by the inspectors. The samples sent, for the most part, are not such as appear to be from products that have deteriorated or "gone bad." Inspectors condemn such products without consulting the laboratories. The samples usually submitted for analysis are apparently good and are taken up in a routine way from the products that are being manufactured in the establishments or out of the stocks on hand. It is quite possible for meat products to appear perfectly sound but on chemical analysis to be found unwholesome, adulterated, or to contain harmful preservatives.

It is against the law for meats intended for consumption to be transported from one State to another unless they bear the mark of Federal inspection. The inspectors have complete control over the use of this mark and will not permit it to be placed on meats that are in any way unfit for food. Only meats that are wholesome and entirely fit for consumption are permitted to leave an inspected establishment.

Much Unsound Meat Is Condemned

During the fiscal year 1926–27, 70,747,182 animals were slaughtered under Federal inspection, and 8,566,443,671 pounds of meat and meat food products were prepared under the close scrutiny of the employees of the service. That number of carcasses and pounds of meat and products were inspected; also 284,316 entire carcasses, 1,058,932 parts of carcasses, and 9,009,132 pounds of meat were condemned as unfit, and were destroyed for food purposes.

While the principal concern of the inspection service is to see that the inspection stamp (fig. 155), which reads U. S. INSP'D & P'S'D, is not placed on meats which are unfit for consumption, the service goes much farther. It prevents the use of false or misleading statements on meats or the containers of meat products. All labels and marks of whatever kind to be used on meats or packages containing meats prepared in establishments operating under Federal inspection must be submitted to the Meat Inspection Division, Bureau of Animal Industry, Washington, D. C., and be approved before their use is permitted.

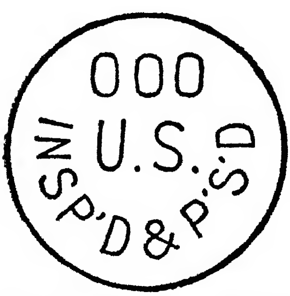

FIG. 155.—The Federal inspection stamp which is placed on meat from sound, healthy animals. This stamp is a valuable protection to the public

About 1,000 such marks and labels are received and acted on by the Washington office each month. This means that when the consumer purchases a product which has been prepared under Federal meat inspection he may feel assured that any statement on the meat or its coverings is true.

FRANK P. ST. CLAIR.

MEATS of Farm-Killed Animals are Exempted from U. S. Inspection The Federal meat-inspection law emphasizes adequate inspection and sanitation. It affords broad authority over the wholesale preparation of meat entering the channels of interstate and foreign commerce. In some cases the inspection required by the law for wholesale butchers and meat packers engaged in distributing meat beyond State lines is somewhat irksome and expensive, as they must conform to restrictions in the construction of buildings, the installation of equipment, and the observance of sanitation.

Because of their wide distribution and limited operations, it is impracticable to furnish inspection for farmers, or to require of them the same standards or buildings, equipment, and sanitation exacted of wholesale producers engaged in constant operations. The law, therefore, makes provision for the farmer to market his meat without inspection.

Exemption for Farm-Dressed Meat

The law provides that the meat of animals slaughtered by a farmer on the farm may be shipped in interstate or foreign commerce without inspection, provided the meat is sound, wholesome, and otherwise fit for human food. In harmony with the law exempting him from inspection, the farmer who chooses to convert livestock into meat on the farm in supplying customers in another State may slaughter and prepare meat, lard, sausage, and similar products which are sound and wholesome and may make delivery by private conveyance, parcel post, or other carrier without seeking Federal permission. When the meat or meat product is offered to a postmaster or agent of an express or railroad company, or other common carrier, for delivery in another State, each consignment must be accompanied by two copies of the shipper's certificate in the following form:

SHIPPER'S CERTIFICATE FOR FARM-SLAUGHTERED MEAT

Date__________________

Name of carrier______________________________

Shipper______________________________

Point of shipment______________________________

Consignee______________________________

Destination______________________________

I hereby certify that the following-described uninspected meat or meat food products are from animals slaughtered by a farmer on the farm, and are offered for transportation in interstate or foreign commerce as exempted from inspection according to the act of Congress of June 30, 1906, and that at this date they are sound, healthful, wholesome, and fit for human food, and contain no preservative or coloring matter or other substance prohibited by the regulations of the Secretary of Agriculture governing meat inspection.

Kind of product	Amount and weight
____________________	____________________
____________________	____________________
____________________	____________________

____
(Signature of shipper)

____
(Address of shipper)

The department does not furnish shipper's certificates, but some of the transportation companies maintain a supply for the use of their farmer patrons. If such supply is not available the farmer may write the certificates or have them otherwise prepared.

Large Volume of Meat Prepared on Farms

That farmers are taking advantage of the favorable opportunity to slaughter their animals and market the meat is evidenced by the records which show that during last year 57,417 interstate shipments were made of meat and meat products derived from livestock slaughtered on farms. The total weight of these shipments was 7,293,271 pounds. Of this large volume veal ranked first with a quantity exceeding that of all other farm dressed meats. Other products, in order, were cured meat, fresh pork, mutton, beef, sausage, lard, headcheese, and scrapple. These meats and products originated on farms in 47 States, of which Wisconsin furnished the largest volume. Next in order were New York, Maine, Pennsylvania, Washington, Minnesota, Vermont, Iowa, and others down to Wyoming, from which only a few hundred pounds were shipped.

R. P. STEDDOM.

MEXICAN Bean Beetle Spreading Rapidly in the Eastern States

One of the most disturbing events in American agriculture during the past decade has been the introduction and rapid spread of the Mexican bean beetle in the eastern part of the United States, because the bean crop of the East had been comparatively free of insect pests. This insect, so destructive to bean foliage, has been known for many years in the Southwestern States, notably in Colorado and New Mexico.

The insect first appeared in the eastern part of the United States in 1920 when it was discovered in 13 counties in Alabama in the vicinity of Birmingham. During the first year of the beetle's occurrence in Alabama, serious damage was limited to a small area, but in 1921 the insect was so destructive that the price of green beans rose to unprecedented levels in the local markets, in some instances reaching a price four times as high as normal. During the same year the insect extended its range rapidly and was found for the first time in parts of six States.

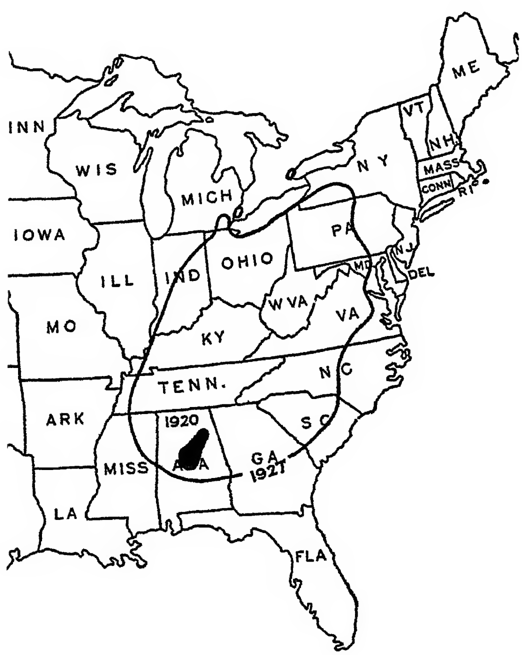

FIG 156 —Known distribution of the Mexican bean beetle in the Eastern States

Throughout the following three years the beetle continued its rapid dispersal and by the end of the season of 1924 had crossed Ohio to the shores of Lake Erie. During the period from 1921 to 1924 when the insect was moving rapidly to the north and northeast it increased its range at an average of 150 miles each year. During the next two years the dispersion was not appreciable except in Virginia, North Carolina, Pennsylvania, West Virginia, and Indiana. In 1927 a marked spread occurred, and the insect is now known to be present in the southeastern corner of Michigan and the southwestern corner of New York, and in Pennsylvania as far east as Tioga and Lancaster Counties, thus including at least three-fourths of that State. It was also found in Canada in several counties which border Lake Erie. The greater part of Maryland is also included, and the insect has invaded the coastal plain in Virginia and the Carolinas. The spread southward and westward was not great. With the exception of the isolated infestation in Thomas County on the southern border of Georgia, the southernmost point reached at this writing is in Stewart County, Ga. The known distribution of the beetle in the Eastern States is indicated in Figure 156.

Depredations Appear Speedily

In the course of its spread northward the insect, in most instances, has severely injured beans within a year or two after reaching a new locality. The experience of the growers in the originally infested area of Alabama, in 1921, was repeated about Chattanooga and Knoxville, Tenn., and Louisville, Ky., in subsequent years. The fact that the beetle occurred over a large area in the eastern part of the United States does not necessarily mean that it has been a serious pest every year over all of that region. In many localities it has been abundant for a season and then subsided only to reappear in injurious numbers two or three years later.

The behavior of the insect in Ohio has been particularly interesting. While it is known to occur in the greater part of that State, it has been injurious only in the southern and eastern portions. From this it appears that the conditions which prevail in the southern and eastern portions of Ohio are favorable to the beetle. It has been observed also that this district in Ohio in which the Mexican bean beetle thrives and seriously injures beans is of the mixed mesophytic forest type and was originally occupied by such trees as beech, maple, elm, ash, walnut, oak, hickory, tulip, birch, linden, and others. The fact that the beetle does not appear to thrive equally well under all conditions indicates that areas may be discovered which will largely escape injury from this pest.

The adult beetles are sluggish as compared with many of the insects encountered in the bean field. They crawl rather slowly and are not easily frightened. At certain times of the year, however, if they are observed closely, it may be noted that many of the insects take wing, and that in some cases they fly high into the air and soon disappear from sight. In August the beetles become particularly restless, and at this time the greatest dispersion takes place. Careful experiments conducted with large numbers of marked beetles have shown that the insect will travel as far as 5 miles in two days, and that movements of 3½ miles in the same length of time are not unusual. In the Southwest it has been shown that in the fall the insect flies many miles to hibernation quarters and back to the bean fields in the spring. The facts that few isolated infestations of the bean beetle occur and that the principal movement of the insect has been in one direction indicate that dispersal has resulted from the flight of the beetle, aided in all probability by wind currents.

Plants the Beetle Feeds On

The food of the Mexican bean beetle is limited largely to the common garden beans, tepary beans, and Lima beans, and to the several varieties of kidney beans grouped under the species *Phaseolus vulgaris* and *P. lunatus*. It can, however, live and develop on certain other food plants. Next to beans it prefers beggarweed or beggartick belonging to the genus Meibomia. Its next choice is the hyacinth bean, then cowpea and soy bean. It may also feed on adsuki bean, kudzu, and some clovers. It is remarkable, however, that in the early part of the season the insect will not, and apparently can not, live on some of these plants, especially cowpeas and soy beans, whereas later in the season it seems to thrive on them. It is only in comparatively rare instances that the insect damages cowpeas and

soy beans in the field, and in these cases it was observed that large numbers had been breeding on garden beans near by and had migrated to these and other plants after having consumed their favorite food.

The injury caused by both the immature form and the adult of the Mexican bean beetle to the bean plant is not likely to be confused with other insect injury. The adult, feeding from below, eats ragged areas in the lower surface of the leaf, but often cuts through to the upper surface, giving the foliage a lacelike appearance. (Fig. 157.) The larvae feed on the under side of the leaf, leaving the upper surface intact. The plant tissue is cut away in narrow parallel sections about the length of the insect's body; between these sections are narrow strips which are left untouched by the insect, resulting in a peculiar network. When the infestation is heavy, the plant is practically destroyed and has the appearance of being completely dried out. After the foliage is destroyed, the insects may attack the pods, and even the stems. When the pest is abundant, a bean crop may be completely destroyed in about four weeks, or before the first pods have formed.

FIG 157.—Severe injury by the Mexican bean beetle to bush beans

Description and Life History

The Mexican bean beetle closely resembles some of the native beneficial lady beetles, to which family of insects it belongs. It is nearly hemispherical, one-fourth of an inch long and about one-fifth of an inch wide, each of the brown or copper-colored wing covers bearing eight black spots. The larva or immature form is orange colored and ranges in length from about one-twentieth of an inch when first hatched to one-third of an inch when full grown, and is covered with long, branched, soft spines which give it a "fuzzy" appearance. (Fig. 158.)

The overwintering beetles appear in the fields at about the time the earliest planted beans show above ground. After feeding for a short time the females deposit yellow eggs in groups of from 40 to 60 on the under sides of the bean leaves. The time required for the development of the insect from the egg to the adult form varies with the climate. The eggs hatch in from 5 to 14 days. The larvae require from 15 days to 3 weeks to mature, and the insects remain in the pupal or resting stage for a week or 10 days. All stages of the pest may be found in the fields at the same time during the summer season. In the South there may be from two to four generations, and in Ohio one or two generations, during the season.

With the approach of cool weather in the fall, the beetles leave the bean fields and seek wooded slopes, where they congregate under accumulations of oak leaves and pine needles, crawling to a depth where the moisture remains fairly constant. Here the winter is

spent. Areas which are covered with a mixture of oak and pine seem to be preferred. In the Southern States the beetles may become active during warm days in winter and in some instances may seek new locations. A few beetles may remain about the gardens and in the fields but the majority of them fly to near-by woodlands.

The insect's mode of hibernation makes it dependent upon suitable cover and good drainage for maximum winter survival. Areas which do not furnish sufficient covering to maintain a certain amount of moisture would be very unfavorable, as would poorly drained areas. In considering, therefore, the possible distribution and economic damage of the Mexican bean beetle, conditions essential to successful hibernation must be taken into consideration as well as the conditions which favor reproduction during the active season.

FIG 158—All stages of the Mexican bean beetle on the under side of a bean leaf, showing feeding marks of adults × 3½

Control by Arsenate Dusts

The suppression of the Mexican bean beetle as a pest at first offered considerable difficulty in the Southeastern States. Lead arsenate and zinc arsenite, insecticides which had been tried in the West, could not be used in the South because they seriously injured the bean foliage. After considerable experimentation it was found that magnesium arsenate or a good grade of calcium arsenate with lime could be used as remedies without injuring the bean plant. These materials gave excellent control when applied as dusts or sprays, in the proper dilutions, to the under sides of the bean plants. Applications have to be made from one to five times, depending on the severity of the infestation. For more detailed information on control Farmers' Bulletin 1407 of the United States Department of Agriculture may be consulted.

NEALE F. HOWARD.

MOSAIC-DISEASE Study Points to Control by Resistant Varieties Progress in the study of mosaic diseases of plants has been quite marked during the past few years. The first disease of this type was described as the mosaic disease of tobacco by a Dutch phytopathologist, Mayer. The disease is characterized by a suppression of growth, especially of the leaf tissue, causing a mottled or mosaic appearance, greatly reducing starch and sugar-manufacturing power of the leaves and causing stunting and malformation of the plants.

Since Mayer's discovery a large number of diseases of this virus type have been found affecting wild and cultivated plants. Some of them are very destructive. Among these the outstanding examples are, in addition to tobacco mosaic, the mosaic diseases of potato, tomato, cucumber, sugar beet, sugar cane, Indian corn, wheat, raspberries, strawberries, and various other fruits. Peach yellows, peach rosette, and Bermuda lily disease also belong to this class.

The economic loss from these diseases is very large some years, amounting in some localities to 100 per cent. Under ordinary conditions the loss is from 10 to 20 per cent. In certain areas of the West the sugar-beet industry has been destroyed by a virus disease, commonly known to beet growers as curly top. Cane culture in Louisiana has been on an unprofitable basis for a number of years, partly as a result of mosaic. Great losses have resulted to bulb growers, especially in Bermuda, and to bulb forcers in this country from the lily mosaic, commonly known as the Bermuda lily disease.

Cause of the Mosaic Diseases

The cause of these diseases is an ultra-microscopic virus, so small that it passes through ordinary filters. Its nature has not otherwise been determined. It has many characteristics of enzymes. It does not appear to be able to reproduce itself except in the tissues of the plant, especially in the leaves and parts containing chlorophyll.

The most recent studies indicate that it may be a disease of the chloroplasts, caused by some organism, possibly of a protozoan type, capable of passing through certain types of filters, but retained by others. It is transmitted mainly by insects, especially plant lice and leaf hoppers. These insects draw their nourishment from the inner tissues surrounding the vascular bundles of the leaves and stems. As the writer has shown in the case of the lily disease and stigmonose of carnations, the insects inject material of a proteid or colloid nature which contains the infective agent into the plant tissues. What changes, if any, this may undergo in the body of the insects is not known. This with the nature of the so-called virus are still subjects for research. It is highly important that these facts be determined with the hope that we may be better able to control these diseases.

Present Methods of Control

At the present time there are two general lines of control: (1) Eradication, as far as possible, of diseased wild and cultivated host plants and control of the insect carriers, and (2) development of strains of plants resistant to the disease. Progress is being made in both directions. Mosaic-resistant cane is replacing the very susceptible varieties; mosaic-resistant potatoes are replacing the nonre-

sistant varieties. The same is true of spinach and other vegetable crops, and lilies, raspberries, and blackberries. Progress has been made in producing beets resistant to curly top.

Here is a field where more fundamental research is urgently needed.

A. F. WOODS.

MOTH-PROOFING Fluids Sometimes of Value When Properly Used The losses caused by clothes moths are so tremendous the world over that many attempts have been made to develop methods for rendering fabrics, furs, and other susceptible materials immune to attack. It has been only within the last five years that so-called moth-proofing solutions have been offered the American public. Interest in these solutions was immediate and nation wide. They have been heralded as a panacea for moth troubles. The Department of Agriculture has been called upon to test the efficacy of numerous solutions to determine whether any of them really can be depended upon to moth-proof fabrics or furs, absolutely and permanently. No solution now offered the American public will do this without either injuring the fabric in some way or leaving a poisonous substance in the cloth.

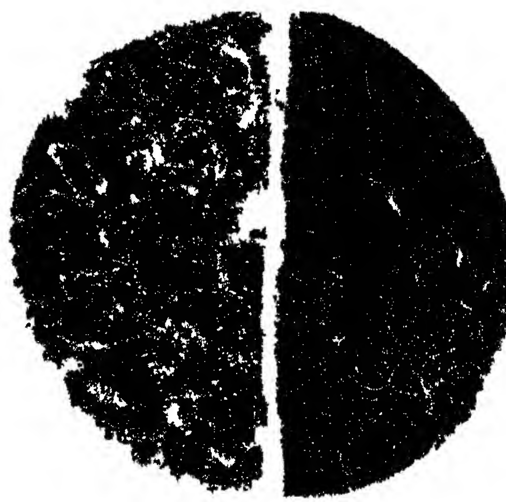

FIG 159—Moth-proofing test Cloth at left untreated, cloth at right treated with one of the better moth-proofing solutions The two cloths were inclosed in a Petri dish with 50 well-grown larvae of the black carpet beetle (*Attagenus piceus*) from March 12 to April 27. Note the almost complete destruction of the untreated cloth

While it is true that no solution has been found that will permanently and absolutely moth-proof fabrics and furs, it is equally true that some of the better solutions are of decided value when properly used. They do not absolutely or permanently protect, but they may render fabrics sufficiently distasteful to moth larvae to postpone or delay appreciable injury for several months.

All Fibers Must be Soaked

To obtain these results, however, the fabric must be thoroughly saturated with the solution so that every fiber becomes well soaked. Even this drenching of the fibers will not in every case prevent feeding where the larvae of fabric pests are faced with the alternative of starvation. In such a dilemma well-grown larvae may cause much injury even though they may not thrive upon their diet. If larvae are

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given a choice of properly treated or untreated fabrics they show a decided preference for the untreated materials, as indicated by the samples shown in Figures 159 and 160.

In most houses it would seem that the larvae will have a choice of foods, and this fact enhances the value of the so-called moth-proofing solutions. No person, however, should use a solution unless its formula is clearly printed on the bottle or container in which it is purchased, as is required by Federal law in the case of all insecticides entering into interstate commerce.

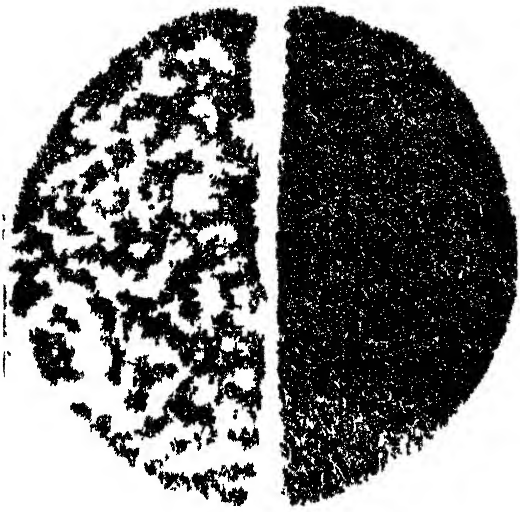

FIG. 160.—Moth-proofing test. Cloth at left untreated, cloth at right treated with one of the better moth-proofing solutions. Both cloths were placed in a Petri dish with 25 well-grown larvae of the webbing clothes moth (*Tineola bisselliella*). Many of the larvae matured into moths which laid many eggs on both pieces. Most of the damage has been done by the young larvae hatching from these eggs. Although about as many eggs were laid on the treated as on the untreated cloth, the young worms concentrated their attack on the untreated cloth. Note that the treated cloth did not entirely escape attack, but that the damage done is very slight in comparison

The first solution offered the American public depended upon its arsenic content for such effectiveness as it possessed. It was finally driven off the market by the adverse attitude of the Journal of the American Medical Society which, in 1923, called attention to the danger of arsenic poisoning. The experiments of the department have since indicated that moth-proofing solutions depending upon any form of arsenic are among the least dependable of the solutions offered the public. Being unreliable, and also possibly dangerous from the standpoint of arsenic poisoning, their use should be discontinued in favor of safer and better solutions.

Solutions that Have Value

Water solutions of aluminum silico-fluoride and sodium fluoride, when used to drench fabrics thoroughly, are of value. A solution containing, according to the analysis of the Bureau of Chemistry and Soils, 0.29 per cent of fluosilicic acid (H_2SF_6), 0.54 per cent of sodium fluosilicate (Na_2SiF_6), 0.5 per cent of calcium fluoride (CaF_2), and 98.67 per cent of water gave the best results of the fluoride solutions of this general type. These solutions are easily removed from fabrics by washing, and none can be depended upon when lightly sprayed on fabrics. To spray a pint or a quart over a man's suits of clothes would not be sufficient protection, judging from the many complaints received in letters from the public.

Solutions consisting of cinchona alkaloids dissolved in a light mineral oil of the nature of naphtha, or those consisting of cyclohexanone and carbocyclic nitrogen derivatives dissolved in such

solvents as benzene, gasoline, or carbon tetrachloride, are of real value when the fabrics are treated by thorough drenching. They are removed during the dry-cleaning process, hence treatment must be repeated.

While the solutions which are claimed to flame-proof as well as moth-proof fabrics seem to be of genuine value in rendering fabrics distasteful to fabric pests, those thus far tested can not be recommended because they have either stained or otherwise adversely affected the fabrics treated. Solutions of epsom salts in water are of no value, in spite of many newspaper reports of their efficacy.

Housewife Must Still Fight Moths

The writers have had much experience in the testing of treated fabrics. They have had many contacts with the public through correspondence from all parts of the country. They have seen many moth-eaten garments that had been guaranteed at the time of sale to be moth-proof. These letters and exhibits, considered in connection with the results of their own experiments, have forced them to believe that much money is being spent heedlessly. Extravagantly worded advertisements have raised hopes that have not been materialized for the average person. Moth-proofing or moth-resisting solutions belong to that class of products that fail to yield results in the hands of the average person because of ignorance, misinformation, or carelessness. The imagination is stimulated by the suggestion that with the expenditure of little money and little effort a garment or house furnishing may be rendered forever immune to insect attack. This millennium has not yet arrived. The housewife will still be forced to fight fabric pests. Her problem may in some instances be made easier by the use of moth-proofing solutions, but she should be thoroughly alive to the pitfalls along this rosy path of protection.

E. A. Back and
R. T. Cotton.

MOTION Pictures on Agriculture Promote International Amity

Motion pictures produced and distributed by the Office of Motion Pictures of the Department of Agriculture have become a means of promoting international goodwill. Though these films are prepared and intended for domestic consumption only, their instructional value and their stimulating, helpful, and uplifting effect in the promotion of a better and more profitable agriculture, a higher standard of living and a happier home life, are recognized throughout the world. Through sale and otherwise, the distribution area has spread into remote countries.

Customs, habits of thought, and language are no bar to the motion picture. The state of agricultural advancement is no hindrance to it. Conditions of soil and climate offer no obstruction. The film speaks the universal language of descriptive action, and the people of Europe, Australasia, Japan, China, India, Siam, Africa, Central America, and South America, now see agricultural motion pictures made in the United States.

Since 1920 no less than 550,000 feet of this department's agricultural films have been sold into foreign countries. Asia, South America, and our neighbors of North America have purchased over 100,000 feet each, while Europe and Africa have each purchased more than 50,000 feet. Australia and Central America have yet to reach the latter mark. Purchases are made not only by the various governments but also by other agencies interested in agricultural development.

Although urgent requests are constantly received, film is not generally loaned outside the continental United States, because the domestic demand is larger than can be met with the available funds. Arrangements have been made, however, under contract with a commercial film concern, whereby copies of department films may be bought by both foreign and domestic purchasers. In this way, a large distribution of the films is accomplished and a great and appreciated service rendered to our sister nations without cost to our Government. These films are continual reminders of unselfish service and messengers of international good will.

Wide Use in the United States

While these films are so eagerly sought by foreigners, our own people are fully awake to their value. State governments, educational institutions and organizations, and individuals interested in spreading the gospel of a better agriculture, purchase annually nearly 400,000 feet of department films, and there are now in domestic circulation probably over 1,500,000 feet obtained in this way. In addition, the department's own distribution agency circulates about 2,500,000 feet of film. In the past year films were furnished for over 16,000 exhibitions before nearly 6,000,000 people. If purchased film was given like distribution—and it probably was—it may be assumed that the department's films are seen by more than 10,000,000 people annually.

How are these films used and why does this great demand exist? In the first place, the agricultural public, whether consciously or not, craves to be informed. When the information is available only in such form as to cause its acquisition to be a more or less tedious procedure, many lose interest. Others find it difficult to acquire information from a printed page or even by oral description. But let the information be presented in well-organized form as descriptive action in a motion picture, with the right proportion of interest-arousing sidelights, and it is quickly acquired, easily retained and assiduously sought. These are the factors which the department's Office of Motion Pictures endeavors to introduce into its pictures and to them may be attributed the wide demand. Agricultural leaders find the department's films indispensable aids in every movement for the betterment of farm, forestry, and home conditions, and teachers to instruct in improved agricultural methods and practices.

Tick-Eradication Films

In every great agricultural movement, the motion picture plays an important part. For instance, in the campaign for the eradication of the cattle tick in the South, a picture prepared for the purpose

was used effectively in winning local support where previously it had been definitely lacking. Instances are recorded where hostile antagonism was converted into active support at a single exhibition. With this lesson in mind, the department prepared 120 copies of films on the corn borer. These films are used in the campaign for the control of this destructive pest.

The distribution service of the department is maintained primarily for county agricultural agents and department field representatives. Many of them are now equipped with projectors. Two of the department's bureaus have specially equipped trucks with which to exhibit films at places not equipped for ordinary projection. Films have played their part in the Americanization of immigrants. Several films are used in the motion-picture programs prepared for immigrants on their arrival in New York.

The supply of films is entirely inadequate. It has been necessary to limit schools to one program a month. In spite of this, over 600 applications were declined last year for lack of films and substitutions made in hundreds of others. Substitution is of course very unsatisfactory to those who are trying to accomplish a definite purpose and need the particular film applied for.

Every effort is being made to increase the supply of films, and to make new ones as fast as practicable and at the same time maintain excellence and accuracy of presentation. Production has been steadily increased from 43 prints totaling about 53,000 feet in 1920 to 280 prints totaling about 389,000 feet in 1927, until now the limit of facilities and funds has been reached without meeting the ever-increasing needs.

C. A. Lindstrom.

NANKEEN LILY Scarce Though Grown Easily in the United States It is remarkable to find this old variety, the Nankeen lily, which has become so exceedingly scarce in Europe, behaving so gloriously in the United States. It seems to be so easily produced and reproduced here that one can not but wonder why it has become so rare in foreign countries where all the commercial stocks have been held.

There are good authentic records of the occurrence of the variety as far back as 1836. As early as 1840 there are accounts of considerable stocks available. Both the Netherlands and the British Isles have furnished all the commercial supply of it ever since.

The bulbs have become scarce in recent years so that now the first size sell for \$1.50 to \$2.50 each. There does not appear to be any good reason for such shortage, for multiplication seems easy on Puget Sound, although the variety is very uncertain in its seed habits. A few successes in seed production are reported, but the writer has never been able to get a crop except by the most heroic methods. These consist in jerking the stems out of the bulbs as the first flowers open and resetting them a little deeper. Careful hand pollination after this has resulted in a considerable set of seed. The same treatment seems to be efficacious with the Madonna lily.

The best methods of reproduction are by scales and layered or heeled-in stems. (Fig. 161.) The lily is dug for propagation in full flower. The stems are heeled-in in the field with 2 to 4 inches of soil

over about 15 inches of their bases. In two months 10 to 20 bulblets varying from one-fourth to 1 inch in diameter have formed.

The scales are removed from the bulb down to the crown for the next year's performance, 30 to 75 of them. If the soil is reasonably dry for two weeks, these scales are put in the field 2 inches deep and

FIG 161—A, stem propagation of the Nankeen lily grown in 45 days from stems jerked out of the bulbs at blossoming time, B, the Nankeen lily reproduced from scales A single 6 inch row across a 3 foot bed undisturbed until the second year It contains 150 bulbs where 100 scales were planted, C, the Nankeen lily under field conditions A portion of the stock the ninth year from four bulbs The stems have been jerked out of the bulbs when in flower each year for nine years

left alone. They callus, begin to form bulblets rather quickly, and come up in the spring. The stems may also be layered in dry sand under glass and will develop much faster. The scales and stems can be incubated under a high temperature of 80° to 90° F. in a saturated atmosphere to accelerate the growth of bulblets.

One Grower's Success

As an illustration of the possibilities in the reproduction of this lily, a brief account of the performance in a single authentic case will suffice. A grower obtained four bulbs from a garden in the Northwest. Two of them were first size and two only half grown. The four might be considered the equivalent of three moderate-sized bulbs. These were propagated for nine years by the methods outlined above. The object was to get up stock, but no great haste was employed, and experience had to be gained as the grower proceeded. The second propagation was a complete failure, because it was conducted too late in the season. During the nine years that the propagation was conducted with the progenies of these four original bulbs a total of 18,000 bulbs of all sizes were taken out of the stock, about 100 of them being fully grown and 3 years of age. The bulbs taken out of the stock were removed mostly during the seventh to ninth years. Seventy-five of the large ones and 8,000 of the small ones were removed at the end of the period. This means that 75 full-grown bulbs and their stems were kept out of the stock the last year. In spite of this, a propagation of 100,000 was actually made the ninth year without at all exhausting the possibilities. Indeed, it is certain that fully 20 per cent more could have been made out of the material on hand without curtailing the turn-off.

It must be remembered that this propagation resulted with no thought of making a record. The grower ventures the opinion that the same material and time could be made to yield a propagation of a quarter of a million in the ninth year. Projecting this computation for another three years, it may be safely assumed that the tenth year should, with care, give a turn-off of 5,000 to 10,000 bulbs, and the eleventh and twelfth years should witness the attaining of full size in 75 to 90 per cent of the remainder. Why is the lily scarce?

DAVID GRIFFITHS.

NAVAL Stores Act Aids Seller and Buyer of Turpentine and Rosin

The Federal naval stores act, which became effective June 3, 1923, is unique among Federal statutes in that it is both a penal and a service act. It provides heavy penalties for violations of its provisions, and, at the same time, offers a means whereby the Government will assist those interested to avoid such violations. A penalty of not to exceed $5,000 or imprisonment not to exceed one year, or both, is prescribed for traffic in willfully misgraded turpentine and rosin. The act, however, authorizes the Secretary of Agriculture to examine, if practicable, upon request any naval stores—that is, turpentine or rosin—and analyze, classify, or grade it at a charge to defray the cost of such service, and to furnish a certificate showing the analysis, classification, or grade. Such certificates are considered prima facie evidence of the quality or grade of the naval stores covered. Although samples taken by the interested persons may be examined and reported on, a certificate is issued only when the sample is taken by a representative of the Department of Agriculture. Furthermore, no certificate will be issued on anything that is not wholly a genuine turpentine or rosin and up to the standard provided in the act for that particular kind.

The service feature of the naval stores act makes it possible for both producers and users to obtain at a reasonable cost accurate and unbiased information as to the composition and grade of any turpentine or rosin. It protects the producer against loss through the undergrading of his rosin and through rejection or claims for rebate on large shipments of turpentine, which the buyer may contend does not comply with the specifications for it. At the same time, it protects the consumer against delivery of turpentine and of rosin which is in fact of a different grade or standard from that specified. Many instances could be cited where, aside from the violation of the law and the risk of its penalties, hundreds of dollars have been saved either to the producer or to the user on a single shipment of rosin or turpentine.

Rosin Inspectors Grade Product

Five Federal rosin inspectors are now stationed in the producing sections. Four of them grade practically all the rosin produced in Mississippi and the greater part of that produced in Louisiana. The other inspector, stationed at Savannah, Ga., is in a position to inspect rosin at the south Atlantic ports and contiguous territory. Another inspector, with headquarters in New York City, covers the northeastern part of the country, and another, at Cincinnati, Ohio, covers the central part of the country. The supervising naval-stores inspector, who supervises and checks the grading of the other inspectors, is stationed in Washington, D. C. Any one of these men is available for grading rosin at the request of either producers or users in any part of the country, under the regulations prescribed by the Secretary of Agriculture.

Government grading of rosin at the point of production practically eliminates all controversy over the grade. The producer is sure of what he is making and selling, and the user knows definitely that he is getting the grades needed for his particular business. Each can avoid losses, sometimes of great magnitude, by availing himself of the service features of the naval stores act. The producer who sells, or the user who buys, "U. S. inspected" rosin is safe.

F. P. Veitch and
V. E. Grotlisch.

NAVAL-STORES Ruling Regarding Turpentine Protects Purchasers

Turpentine is easily adulterated with mineral oil, and the average buyer is often unable to recognize that he is getting an adulterated, cheaper article, even though the proportion of adulterant present is relatively large. It does not pay either a small or a large user of turpentine to buy the adulterated product as it is sure to cost more than its constituents bought separately. If the purchaser feels that a mixture of turpentine and mineral oil is suitable for the purpose for which he intends to use it, he will find it more economical to buy these separately and mix them in the desired proportions.

The Federal naval stores act, which was passed by Congress to protect both the producer and user of turpentine and rosin by insuring, on the one hand, that he sell, and, on the other, that he receive a

standard genuine product, recognizes three kinds of turpentine, (1) gum spirits of turpentine, made from the gum from living pine trees, and the first kind of turpentine known, (2) steam-distilled wood turpentine, made by steam distillation of pine wood, such as old stumps and resinous knots remaining on cut-over land after removal of the timber, and (3) destructively distilled wood turpentine, made from such pine wood by the destructive-distillation process.

Secretary May Establish Standards

The act further provides that the Secretary of Agriculture may modify the standards established by the law when the interests of the trade so require and may establish new standards for turpentine for which no standards are provided in the act. Although the law, like most other Federal laws, apparently applies only to the sale of products in interstate commerce, any purchaser can materially assist in its enforcement, and at the same time protect his own interest, by specifying in his order the particular kind of turpentine which he desires in the terms just given, which are used in the act, insisting also that it be labeled and billed in the same terms. If he will buy turpentine in this way, and have it billed in the same way, the Federal naval stores act will protect him, even though the transaction is conducted wholly within one State.

Many of the States have laws governing transactions in paints, varnishes, turpentine, and linseed oil. These too are for the protection of the citizens of the State. In case a purchaser has reason to think the article bought is not what it is represented to be, he should first take the matter up with the proper State authorities, usually the food and drug commissioner or the commissioner of agriculture, whose office is usually at the capital of the State. In order that the United States Department of Agriculture may afford a purchaser legal protection under the Federal naval stores act a representative of the department must draw the sample and obtain from the purchaser the necessary documents having to do with the sale of the turpentine. However, when the purchaser has good reason to think that the article in question is not what it is represented to be, the department is glad to receive samples, accompanied by full information giving the name and address of the seller. Such samples will enable the department to more actively and effectively enforce the act, thus gradually putting an end to the adulteration of turpentine.

F. P. Veitch and
V. E. Grotlisch.

NAVAL-STORES Yield Much Affected by Methods of Chipping It is customary for naval-stores operators to count on a steadily declining yield from the first year of working the trees, amounting in many cases to as much as 5 barrels of spirits to the crop annually for the first four or five years. But with efficient work under Government specifications on the Florida National Forest the annual loss during eight years continuous operation of front faces has been kept to less than one-half of that. At the Starke (Fla.) branch of the Southern Forest Experiment Station the yield during the fifth year of conservative work on young slash pine timber has been between 85 and 90 per

cent of the first year's run. This represents an annual decline in yield of only about 1½ barrels of spirits to the crop on 40-barrel timber.

The loss in dead trees and trees abandoned because of dry face has also been very much reduced through conservative chipping. In commercial practice whole stands of timber are sometimes wiped out by fire and windbreak, following heavy turpentining, and it is not uncommon to see down timber and abandoned faces scattered through old turpentined stands. With light work the mortality during a four-year period in second-growth timber can be kept to 0.3 per cent annually, as has been demonstrated on 1,000 trees operated by the Forest Service at Starke.

It is good practice to place faces under the heaviest part of the tree crown. Experience has shown that on that side of the tree the wood is apt to be more productive than on the side under a thin top, where dry face is likely to develop.

The cut for inserting tins should be very light, barely cutting the wood. At most it should not exceed the greatest depth of the streak. Any cut which interferes with the circulation of the sap also tends to interfere with the functioning of the resin ducts.

Depth of Chipping

Among the variations in chipping methods which affect the yield, the most important is depth of chipping. During four years of work deep chipping in long-leaf timber at Starke has resulted in 10 per cent greater decrease in yield than shallow chipping. In crowded stands of young slash pine the difference has been even more marked, amounting to 23 per cent in four seasons. There has also been a great deal more dry face in the deeply chipped groups. Results so far obtained indicate that chipping between one-half inch and one-fourth inch deep for long-leaf pine and about one-half inch deep for slash pine will give the best sustained yield.

Tests conducted by the Forest Service have shown that hacks which cut away one-half inch or less of wood for each streak produce a greater yield over a four or five year chipping period than hacks cutting streaks three-fourths inch wide or greater. At Starke, Fla., two groups of trees were chipped one-fourth inch wide and three-fourths inch wide, respectively. Although the wide chipping gave slightly more gum during the first year, the narrow chipping is yielding at the rate of 8 barrels of spirits to the crop more than the wide during the fifth year. The faces in this narrow chipping test were not "turned to a puller" until the middle of the fifth season, whereas it is not uncommon in commercial practice for faces to be so high that a puller must be used before the end of the third year. The narrow chipping prolongs the working life of the face by one to three years, with an increase in cuppage value of $500 a crop for each additional working year.

Close Cupping Causes Loss

Heavy loss is brought about by close cupping; that is, the chipping of trees that are too small, the placing of two faces on trees that should have only one, and the use of wide faces. A group of small two-face trees at Starke has been compared with a similar group with only one narrow face to a tree. During the first year the yield

per face from the two-face trees was 92 per cent as much as from the single-face trees. During the fifth year, however, the yield per face from the double-face trees dropped to 62 per cent of the yield obtained from the trees with only one face, and is now only 53 per cent of the first year's yield. Single faces cutting away one-half of the bark circumference yielded 24 per cent more than single faces cutting only one-quarter of the circumference during the first year, but only 16 per cent more during the fourth season. There was much breakage and dry face in both the wide-face and the double-face groups, whereas the conservatively faced group had very little loss from this cause.

Other variations in naval-stores practice result in variations in yields; but deep chipping, wide chipping, and close cupping, account for a very large proportion of the damage done to young stands of timber. Through the use of conservative chipping as described above, damage may be avoided and yields held to a high figure. The result is greater profits with no extra operating costs and young timber kept in the best possible condition to produce timber products as well as naval stores.

LENTHALL WYMAN.

NEGRO Extension Work Much Aided by Use of Movable Schools The use of the movable school in negro extension work was first developed in Alabama in conjunction with the extension activities of Tuskegee Institute. To-day it is an important feature of the extension work among negroes in Alabama. The object of the movable school is to present to the farmers concrete illustrations of a kind that will prove to them that they can do better work, that they can make more produce on a small number of acres of land at less expense, and that at the same time they can beautify their homes, thus dignifying and making country life more attractive and remunerative.

The equipment and personnel of the movable school is moved from place to place in a large specially designed truck, demonstrating in each community visited the latest methods recommended by the extension service. The truck carries a complete stock of farm implements and home conveniences such as the average farmer would be able to purchase or construct and operate. Accompanying it are three trained workers—a man to demonstrate the use of the farm equipment and teach improved methods of farming; a woman to show how to make and use the home conveniences, how to care for poultry, and how to cook, can, and conduct the home on a more healthful and economical basis; and a nurse who gives demonstrations in simple practices of home sanitation and hygiene and in care of the sick. The truck also carries a complete motion-picture outfit and a phonograph. The workers conduct practical and constructive agricultural, home-economics, and health teaching in a most effective manner.

The movable school owing to its novelty and practical aspect apparently is of sufficient interest to cause negro farmers to assemble in large groups at homes strategically selected in the communities visited. It is here that the movable school and its working force go to the bottom of the negro rural problem. The first thing that happens at the home chosen for the school site is that the head of the family usually begins cleaning up around the ofttimes miser-

able little shack. The choosing of a particular home as a place for a movable school awakens a latent pride that we all have in a greater or less degree. Aside from the valuable instruction given to that particular family and the other members of the surrounding community during the period of the school, the school causes many people to visit afterward that particular home and note the improvements made. (Fig. 162.)

Wherever the movable school force goes into a community and operates for a week, as is customary, the leading white and colored people of the community usually come out and inspect the type of work being done. Following the holding of such a school, extension work in that section has invariably had more intelligent and liberal local support. In fact, the effort is made by all local negro extension agents to use the movable school demonstrations as the beginning of a definite and systematic method of teaching better farming and more comfortable home surroundings

FIG. 162.—An improved negro farm home The movable school has frequently been the first step toward the improvement of the negro farm home

The following statement appearing in the Selma Times Journal gives an excellent view of how these schools are conducted and how they are regarded locally in the sections where they are held:

The agricultural movable school which has been working among the negro farmers of Dallas County for the past four weeks wound up its activities Friday, filling the last engagement 7 miles west of town on the Moore place. At least 10,000 negro farmers, men and women, have attended the sessions and witnessed the demonstrations. Thursday's meeting at Molette's Bend, was one of the most enthusiastic and best attended in the county.

Demonstrations given daily on the program included such practical lines of work as cultivation, controlling insects, care of fruit trees, gardening, repairing, the care of poultry, cooking, and home making. Nineteen sanitary toilets were built in the county, one being placed in each neighborhood as a model. Dr. L T. Lee, county health officer, addressed several of the larger meetings on elementary health subjects, malaria, hookworm, and communicable diseases. At night educational films were exhibited and many impressive lessons and many scientific discoveries, largely new to many who saw them, were thrown upon the screen.

The school has undertaken to show in many practical ways how to look after matters of cleanliness and air and security from the elements and healthfulness and cooking and other common, everyday fields of household economy that have a very vital bearing on the negro family, and these lessons and demonstrations are bound to be reflected in an improved home life for the negro.

The white landowner, outside of humanitarian considerations, has a very definite stake in the movement to improve the homes of his tenants because he knows it will mean more contented labor and a better environment, increasing healthfulness and freedom from evil propensities. Improved homes will not only help to stabilize the negro farmer and check his migratory proclivities, but they will be a permanent influence in building up his efficiency as a worker and his productiveness on the farm. Better homes will make of him a more valuable economic asset in every way.

In conducting these schools very little lecturing and no pleading is done. The farmers are not only told how to do, but are taught how to do under the supervision of instructors. These simple, practical demonstrations go a long way toward stimulating the

FIG. 163 — Demonstrating how to can fruits and vegetables. This group is typical of the sessions of the movable school and of the follow-up work done by local negro agents

interest of the negro farmer in his home and strengthening his attachment for it, even though he may not own it. The work of these schools has a tendency to arouse in the tenant farmer the desire to own property. They cause the country women to adopt practical methods in thrift and more industrious habits in home making. (Fig. 163.) The program of the movable school also includes athletics for the farm boys and girls and various forms of mild recreation for grown-ups.

The history of the movable school dates back to about 20 years ago. In the country about Tuskegee, which is itself situated on what was at one time a big cotton plantation, many colored people were living, most of them in miserable shacks, eking out a bare existence on their poorly worked farms. Booker T. Washington realized the importance of getting hold of these people in some way and helping them. He began by holding little farmers' meetings. He would

have groups of these people come in to Tuskegee once a month to talk over their problems, and in anticipation of their coming would have simple, attractive exhibits of farm products from the institute's farm put on display with the hope of giving these untrained men a desire to learn how to grow better crops.

Out of this desire on the part of Doctor Washington developed the movable school idea. The first outfit was transported over the county in a large wagon drawn by a pair of mules, known as the "Jesup agricultural wagon." Doctor Washington contended that too few of the people who needed instruction and inspiration got it, for the simple reason that they were too timid to come to such conferences as were being held from time to time at Tuskegee. His idea was that some plan should be devised whereby better methods

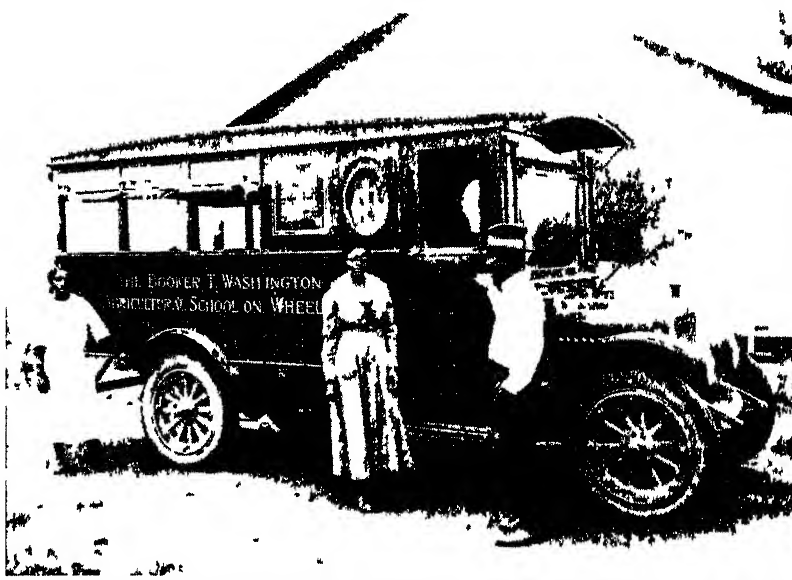

FIG. 164.—"The Booker T. Washington agricultural school on wheels" and its field personnel, the latest model of movable school to be used in negro extension work

of farm and home life could be taken to this discouraged and submerged class of people. He said upon one occasion:

> I am extremely anxious to try out this new plan for the benefit of the masses of rural people, because it is evident that we must, in a larger measure, take most of the information to their doors if they are ever to get it.

In carrying out this program Doctor Washington insisted that the agent make the largest possible use of the demonstration or illustration, instead of speech making. He said:

> Instead of telling the farmer to raise a better pig—raise the pig, and the farmer will never forget it.

From this small beginning the project was so successful that later, when automobiles came into use, a truck known as the "Knapp agricultural truck" was substituted for the "Jesup wagon." This new conveyance enabled the school to cover more territory, carry more equipment, and operate in more counties of the State. In 1923 the scheme was pushed further by money raised from some

30,000 negro farmers and their friends. A modern truck, especially designed for the work, known as "The Booker T. Washington school on wheels," was built and put into service. (Fig. 164.) It is generally felt that the benefits derived more than justify its operation.

The uneducated mass of adult rural negro people in the South will never be able to take their places as citizens, nor will their children be able to take advantage of the improved school facilities until they are made aware that these exist. This knowledge can best be imparted by direct contact in their own environments. The movable school meets this in a unique way.

The negro extension agents spread out over the South are so few in number that it is next to impossible to reach the masses adequately unless some means, in addition to the regular visit system, is devised.

T. M. CAMPBELL.

NEMAS Sometimes Aid Man in His Fight to Control Insect Pests It was not foreseen that nemas—nematodes or roundworms—well-known and dreaded parasites of man and higher animals as well as of plants, would prove beneficial. Few realized that the lower animals, among them insects, have so many nemic parasites. It turns out otherwise; moreover, some nemas are extremely destructive to baneful insects. Nemas become man's allies by attacking in various ways the myriads of insects that year after year so seriously damage him in the most varied fields of activity.

Furthermore, there is ever-increasing evidence that free-living soil nemas also aid man in this battle. Many such nemas—Rhabdites, Diplogasters, Cephalobi, etc.—devour insect eggs located in the soil. Entire egg masses of grasshopper eggs are thus destroyed. In other instances larvae, pupae, even adult insects, become the prey of swarms of these seemingly insignificant soil nemas. Cases are known where nemas act as carriers of the germs of insect diseases (bacteria, protozoa, fungi), and in such cases partial credit is due the nemas.

The effects of nemic parasitism on insect hosts vary greatly. Some nemas seem to have hardly any effect, especially when they are present only in small numbers, or when of small size. But others kill the insect, or sterilize it, reduce its fertility, or lengthen the time needed for development, reduce its growth, or weaken it.

The mermithids, long known to laymen as "hair snakes," constitute an outstanding group of relatively large parasitic nemas specially adapted to insects. Some mermithids may reach a length of 30 inches. Entering the insect in a very young, microscopic stage, or being swallowed in the egg stage, the mermithid matures within a few weeks, then leaves the host in order to enter the soil or other hiding place for copulation and egg production. Mermithids are so large that even a single specimen, on vacating, usually leaves the host insect in such an exhausted state that it soon dies. There are 200 to 300 species of mermithids known. They attack many different orders and species of insects, and some of these insects are notable pests, such as grasshoppers and earwigs, mosquitoes and gnats, May beetles, ants and wasps, the gipsy moth, the codling moth, cutworms, etc.

From 80 to 90 or even 100 per cent of the grasshoppers of a given area have been observed to be infested by mermithids. Recent investigations prove the possibility of colonizing mermithids on areas where the insects are not infested, and methods of doing this on a larger scale are in prospect.

There is a field for insect control to which nemas seem especially adapted, one open to but few other control agencies, namely, the insect fauna of the soil. Many very destructive insects inhabit the soil during long larval periods; for instance, the June-beetle larva represented in Figure 165. While in the soil such pests are well protected from man's present mechanical and chemical control measures.

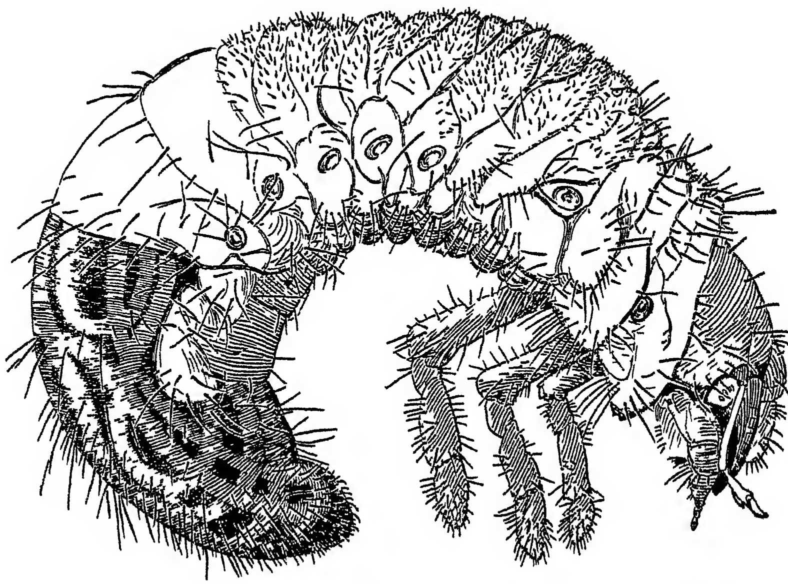

FIG. 165.—A larva (grub) of the June beetle (*Phyllophaga* sp.) infested with a nema (mermithid) which can be seen through the transparent wall of the abdomen as a coiled white thread. The length of the nema in this case was about 18 inches. (After a pencil drawing by the late W. E. Chambers)

A modern endeavor is to bring insect pests under natural control; that is, to restore a balance which man has disturbed by his own actions, a balanced condition in which the insects were held in check by their parasites and other enemies. The "natural control" of insects will be most effective if all possible agencies and factors are utilized; among these agencies nemas are by no means negligible.

N. A. COBB.

NITROGEN from the Air Fixed as Plant Food Mainly by Bacteria All the nitrogen present in our soils and crops presumably existed at one time in the air as free gas. This nitrogen gas is unavailable for use by higher plants, so that it must be fixed or combined with other elements to form salts, such as sodium nitrate or urea, before it is available as an element of plant food. In nature there are only two methods of importance for bringing about nitrogen fixation; by elec-

tric discharges in the atmosphere, and by fixation by lower microorganisms, mainly bacteria. On the average, electric discharges are responsible for about 5 per cent of the total quantity of nitrogen that is fixed in nature, and bacteria for the remainder. In addition, commercial methods of nitrogen fixation are rapidly being developed, but less than 1 per cent of the nitrogen used in the United States by plants comes from this source.

Nitrogen fixation by microorganisms is brought about chiefly by two groups of bacteria, those that live in soils and fix nitrogen independent of higher plants, and those that live on the roots of leguminous plants.

The quantity of nitrogen fixed by the first group depends chiefly on the amount of energy that is available in the form of decaying plant residues, and on the absence of soil acidity. From 10 to 25 pounds of nitrogen are commonly fixed per acre annually by this method, which may represent 50 per cent of the total nitrogen removed in the crop. The economic importance of these bacteria is, therefore, far greater than is commonly supposed. Nitrogen fixed in this manner costs nothing.

The quantity of nitrogen that is fixed by the second group of bacteria, the legume nodule bacteria, commonly varies from 30 to 200 pounds annually per acre of legumes. Hence, fixation by these organisms has far greater possibilities than by the first group; but the nitrogen is not usually obtained without some effort on the part of the farmer to create conditions that are favorable for these bacteria. The use of lime, phosphates, potash, and a suitable inoculating medium may be necessary. If it is assumed that soil conditions are suitable for the growth, both of leguminous plants and of bacteria, and that the legume is used for feed, the cost of the nitrogen may be insignificant. If the leguminous crop is grown solely for the purpose of obtaining nitrogen, and the crop is plowed under, then the cost may be greater than if nitrogenous materials were purchased in the form of commercial fertilizers.

Studies have been in progress in the Bureau of Chemistry and Soils to determine the mechanism by which bacteria are able to utilize atmospheric nitrogen. Experiments to determine what takes place in legume nodules have been of particular interest. The generally accepted theory is that the legume nodule bacteria, which commonly live in soils, enter the root hairs and multiply, forming the enlargements. In these nodules the bacteria fix nitrogen, which is absorbed by the host plant; the host plant, in turn, supplies the bacteria with sugars and mineral matter. This theory is far from being proved and further information on this subject is needed. Such information might suggest a new and cheaper commercial method of nitrogen fixation.

F. E. Allison.

NUTS Promise to Be Profitable Crop in Northern States Nut growing as a source of profit in certain of the more favored regions of the North is at a point where it appears likely soon to become a successful reality. Present indications are that the earliest developments of importance in this direction may be looked for in southern and southwestern

Illinois, southern Indiana, and in the Chesapeake Bay region of the Atlantic seaboard in much the order named. Environmental conditions in other localities, especially at similar latitudes and altitudes, are doubtless equally suitable, but established plantings and top-worked chance seedlings already beginning to bear in these particular sections give them the advantage of from 1 to 25 years over most others where later developments have been established. There are a few profitable plantings at considerably higher latitudes, notably in western New York, but the numerous failures which have met attempts at their duplication clearly emphasize the importance of exercising the greatest possible care in combining hardiness of plant and variety with suitability of planting site and in giving the trees satisfactory cultural environment.

In the main, up to this time, profit from nuts grown in this country north of the southern pecan range and east of the Rocky Mountains is almost wholly from native species grown with little or no cultivation. Before the arrival of the oriental chestnut-bark disease, and the consequent practically complete destruction of the native chestnut trees in middle Pennsylvania and on the Atlantic slope of the Alleghenies from lower New England south to the Carolinas and Georgia, the nuts from the wild trees of that species probably brought the gatherers a greater cash profit than did the crops from all other native species of nuts in the North combined. Farther west, that is, from western New York southward through the Ohio Valley and on to northern Alabama, the native chestnut trees still yield profitable crops; but taking the North and East as a whole, it is the shelled black-walnut crop that is now giving by far the greatest cash return. Production from northern nut trees under cultivation is not yet an item of much importance.

Important Nut Trees in Mid-West

The species which are thus far of leading importance in extent of planting and degree of fruitfulness in the regions of the Middle West referred to as showing the greatest progress are the chestnut, black walnut, pecan, and filbert, in the order named. On the Atlantic slope, however, the chestnut drops out entirely and the black walnut becomes first in importance, followed by the pecan, filbert, and Persian (English) walnut in rather uncertain order.

There are three known orchards and grove plantings of chestnut trees in southern Illinois which for many years have annually given highly satisfactory yields. Nuts from these trees (fig. 166) have readily brought from 18 to 30 cents a pound in Chicago, depending upon the grade and the market conditions, less commission and shipping charges amounting roughly to 5 cents a pound. These nuts normally mature in time to reach the market well in advance of the imported product from southern Europe, which retails at about one-half or two-thirds these prices. Nevertheless, even in competition with foreign nuts, the late home-grown varieties have an established reputation which enables them to command a margin in price of several cents a pound during the early part of the import season.

The Illinois-grown chestnuts are principally of either European × American or Asiatic × American parentage. Some of the former are

such varieties as Paragon and Ridgely, widely known east of the Alleghenies during the nineties and the first decade or more of the present century, but now practically extinct in that section. Others of a similar parentage include the Rochester and such of its seedling varieties as Champion, Fuller, Progress, and Van Fleet, all of Illinois origin. The Japanese group chiefly includes the Boone, a Japanese × American cross effected in Illinois, and its seedlings, as well as some others without definitely known parentage.

Farther east, the present chestnut situation represents little more than a wreck of a former potentially great industry, but now a victim not only of the introduced bark disease, swiftly fatal to both American and European species, but also of native weevils, which appear to

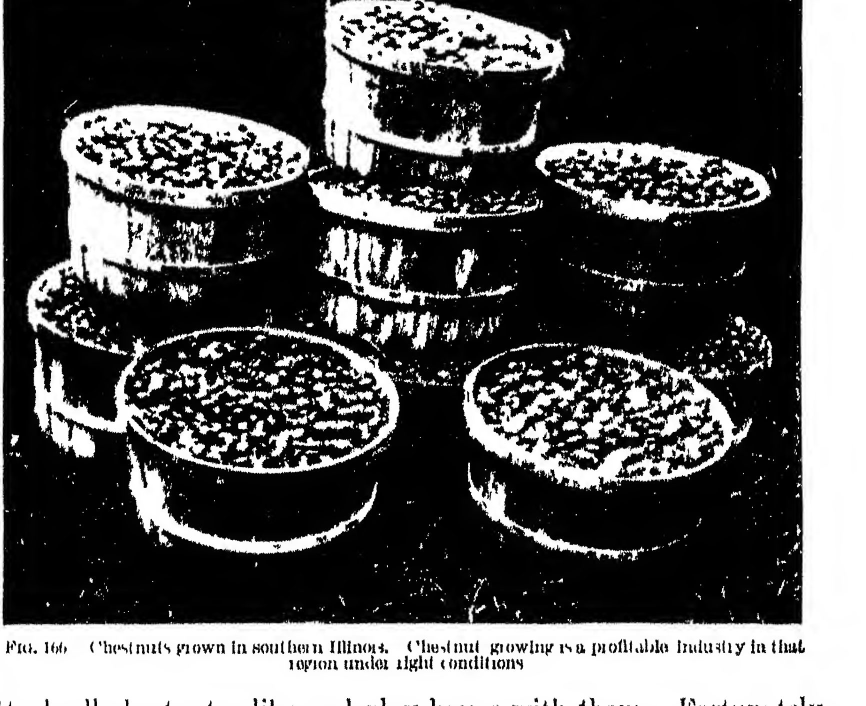

FIG. 166 Chestnuts grown in southern Illinois. Chestnut growing is a profitable industry in that region under right conditions

attack all chestnuts alike and play havoc with them. Fortunately, neither the disease nor the weevils are yet important factors in the Illinois region.

Chestnut Outlook in the West

Present indications point somewhat encouragingly to possibilities of developing a chestnut-growing industry in the Middle West and on suitable sites of the Pacific coast. In the East it is apparent that profitable chestnut growing must await both the development of blight-resistant varieties of superior nut quality and some means of successfully combating the weevil before it can again assume special importance in that part of the country. Some progress in these directions, however, is being made.

Taking the entire North as a whole, the black walnut promises to become the leading nut producer in developments throughout that

part of the country. Its wide geographic range of adaptability, the present degree of popularity which its kernels enjoy with consumers of confections, the discovery and propagation of varieties of merit, and the perfection or adaptation of machines for removing the hulls and cracking the nuts are factors contributing largely to this promise.

Nursery-grown trees of promising varieties of black walnut did not become available for planting in quantity until about 1920. It is probable that from 5,000 to 15,000 grafted trees are now being annually disseminated by the nurserymen. These are being planted throughout a wide portion of the country. The earliest plantings are already beginning to bear and, together with numerous top-worked seedlings, give indication of satisfactory bearing capacity at relatively early ages.

A number of varieties are being propagated, but those now chiefly available from the nurseries are the Ohio from the northwestern part of the State whose name it bears, the Stabler (fig. 167) from the

FIG. 167.—Stabler black-walnut trees at Bowie, Md., set out in April, 1918, and photographed in October, 1927

north-central part of Maryland, the Ten Eyck from northern New Jersey, and the Thomas from southeastern Pennsylvania. As a group, trees of these varieties under favorable environmental conditions begin to bear at about the same ages as apple trees do. All are not equally hardy, however, and apparently none should be extensively planted where climatic conditions are appreciably more rigorous than at their place of origin.

Pecan is Less Hardy

The pecan has perhaps received attention at the hands of discriminating planters longer than has the black walnut, but it is less hardy and should be selected for planting with greater attention to the matter of climatic environment. There are very few orchards of recognized varieties within the zone to which such varieties are likely to be best adapted upon which to base an estimate as to what yields may be expected. J. F. Wilkinson, of Indiana, has, however,

kept a record of the yields of four trees, and submits data from which Table 14 has been arranged.

TABLE 14.—*Yields of four pecan trees near Rockport, Ind., 1920–1926*

Variety	Year planted	Yield (pounds)		
		1920	192	
Busseron	1913	1 5	[illegible]	1 86
Greenriver [3]		3	[illegible]	38
Indiana	1913			62
Major	1915			45

[1] Estimated.
[2] The whole crop was estimated at fully 100 pounds
[3] The Greenriver tree was budded in 1915 and left in the nursery row It bore a few nuts in 1917 and in 1918 and 3 pounds in 1919.

These records are from well-grown trees under highly favorable environment. They may be exceeded by yields of other trees which later come into bearing, or they may not again be equaled. They are published for the reason that they are believed to be fairly representative of what may be expected of similar plantings, and because few records of this character are available.

About six or eight varieties, all of which appear about equally promising thus far, are being propagated by nurserymen and used by planters. With few exceptions, all originated in what may be called the Evansville-Vincennes district, which includes parts of Indiana, Illinois, and Kentucky. The ones more commonly grown include the Busseron, Butterick, Greenriver, Indiana, Major, Niblack, Posey, and Warrick.

The Filbert

The filbert or hazel is at present of uncertain status in the North. Early planters abandoned it entirely after making many pioneer plantings and failing to get satisfactory crops of nuts. As a rule, the trees died while still young because of blight, but before doing so they failed to bear well, apparently because of freezing injury to the flowers. The present outlook is somewhat brighter, however, as hardier varieties are now being grown, and for some reason blight has seldom been troublesome in recent years. Furthermore, all plantings are being so arranged that cross-pollination is insured, and the trees are trained to single stems instead of being allowed to grow as thickly crowded stools, as was formerly the case. Winter injury is still a factor, but encouraging yields of filberts are not uncommon in rightly chosen localities.

The Persian Walnut

The Persian (English) walnut, although in the past offering small inducement as a source of profit to northern planters, is often highly satisfactory as an ornamental or garden tree, and in favorable years it bears heavily in many places. It is less hardy than the northern black walnut and in so far as possible should be protected from both extremes of temperature in winter and late freezes in spring. Near large bodies of water, as about the Great Lakes region, especially in

western New York, and in the Chesapeake Bay neighborhood on the Atlantic seaboard, this walnut is so often successful that further plantings would appear justifiable.

Miscellaneous Nuts

While no other species of nuts are now being planted to an important extent in northern orchards, there are recognized varieties of shellbark and shagbark hickories, butternut, Japanese walnut, and hickory hybrids which deserve appropriate attention. The hickories and their hybrids are of much promise but need further development before extensive plantings would be advisable. The butternut and Japanese walnuts are much alike in habits of growth and in flavor of kernel. The former is a native species whose indigenous range extends from Nova Scotia to Arkansas and which is not adapted farther south, whereas the latter often does well from the coast of the Gulf of Mexico to the lower Great Lakes region. Named varieties of hickory and butternut are being propagated by nurserymen to a limited extent only. Those of hickory hybrids and Japanese walnuts, however, are more common; butternut varieties are scarcely available at all.

Future Development

The native northern species of nuts include some of the most palatable kinds on the market. They lack the long-continued cultivation and consequent improvement of some of the introduced species from the Old World, but under modern horticultural practices they are responding favorably, and improved production in the relatively near future does not appear improbable.

Probably the opportunity for nut profit in northern nut growing is greatest in its development as a by-product of the farm. The fertile but otherwise unused spots or strips that are everywhere familiar, such as corners about buildings and fences and along ditches, or on hillsides too steep for cultivation, and in valleys among mountains and hills, give an aggregate of many thousands of acres which could easily be made productive at minimum cost by devoting them to nut trees of suitable varieties. Many such spots already have seedlings which could be quickly made more profitable by being topworked with scions of superior varieties.

C. A. Reed.

OATS of New and Improved Sorts May Now Be Registered

As an aid in the improvement of cereal crops a register for improved varieties has been cooperatively established by the American Society of Agronomy and the Bureau of Plant Industry. The first varieties registered were those which have been recognized for some time because of their agricultural importance and rather definite characters. New and improved varieties and strains, determined on the basis of their merit and performance, as shown by carefully conducted experiments, were first registered in 1926. The improved registered oat varieties, grouped according to time of seeding and ripening and color of kernel, are given below:

Group and varietal name

Spring oats:
- Early black—
  - Colburt.
- Early yellow—
  - Richland.
  - State Pride.
- Early white—
  - Albion.
  - Gopher.
  - Iowar.
  - White Cross.
- Midseason gray—
  - Cornellian.
- Midseason yellow—
  - Iogren.
  - Markton.

Spring oats—Continued.
- Midseason white—
  - Colorado No. 37.
  - Comewell
  - Empire.
  - Forward.
  - Idamine.
  - Ithacan.
  - Minota.
  - Standwell.
  - Upright.
  - Wisconsin Wonder.

Winter oats:
- Midseason black—
  - Tech.
- Midseason yellow—
  - Lee.

These improved varieties and strains were developed by various agencies. Those developed cooperatively by State agricultural experiment stations and the United States Department of Agriculture are: Colburt, with Colorado; Richland, Albion, Iowar, and Iogren, with Iowa; Cornellian, Comewell, Empire, Ithacan, Standwell, and Upright, with New York (Cornell); Markton, with Oregon; Idamine, with Idaho. Those developed independently by State agricultural experiment stations are: State Pride, White Cross, Forward, and Wisconsin Wonder, by Wisconsin; Gopher and Minota, by Minnesota; Colorado No. 37, by Colorado; Tech, by Virginia. The Lee variety was developed at the Arlington Experiment Farm, Rosslyn, Va., by the Bureau of Plant Industry. A brief description of these varieties and their adaptation follows.

Characteristics of Varieties

Colburt was obtained as a pure-line selection from Burt. Its superior characters are early maturity and high-test weight. Colburt is especially adapted for growing under dry-land conditions. Its distribution has been limited to northeastern Colorado.

Richland is a pure line from Kherson. Its desirable characters are high yield, resistance to stem rust of oats, and adaptability for growing on low, rich soils where taller varieties frequently lodge. Its short straw is a disadvantage on thinner soils, frequently growing too short for convenient harvesting. Richland is potentially valuable for breeding other varieties resistant to stem rust. Over a half million acres of Richland were grown in 1924. The resistance of Richland to stem rust is a most valuable asset during years of severe rust epidemics in the Corn Belt, such as were experienced in 1926 and 1927.

State Pride is a tall selection from Kherson. It is recommended where taller strains of that variety are in demand. The superior characters of State Pride are high yield, earliness, and adaptability to fertile soil. It is grown commercially in Wisconsin.

Albion has met with favor among the farmers of the Corn Belt because of its early maturity and white kernels. It was grown on nearly one and a half million acres in Iowa in 1924. This acreage undoubtedly has materially increased since that year, especially in

adjoining States, and to-day Albion is the leading early variety grown in the Corn Belt. It is a selection from Kherson.

Gopher is a pure line from the Sixty-Day variety, with slightly plumper kernels than Albion. Its adaptation is similar to that of Albion. Because of excellent kernel characters and stiff straw, Gopher is one of the most promising of the early white sorts.

Iowar differs from Albion only in having a little coarser and taller straw and in ripening two or three days later. Iowar has slightly exceeded Albion in yield on Iowa farms. In 1924 approximately 800,000 acres of Iowar were grown in Iowa, with perhaps an equal or even greater acreage in adjoining States.

White Cross resulted from a cross between Big Four and Sixty-Day. It is especially adapted for growing on light soils in Wisconsin.

Cornellian is an oat with tall straw and slender, awnless gray kernels. Because of its low percentage of hull and high yield, Cornellian has become popular among farmers of New York. Ordinarily a gray oat is commercially objectionable. The color of Cornellian, however, is not a handicap, as most of the crop is utilized on the farms where grown. Its color is an advantage in identifying the variety for certification and in maintaining varietal purity.

Iogren is the product of a plant selection from Green Russian. It is superior in yield and quality to the original variety and is meeting with much favor in northwestern Iowa.

Markton is of interest because of its resistance to the smuts of oats. It is promising commercially in the Pacific Northwest States. Markton also is valuable for breeding purposes. It is not well adapted to the Corn Belt, owing to later maturity and susceptibility to the rusts of oats.

Colorado No. 37 is grown extensively under irrigation in Colorado and adjoining States. It differs from the Swedish Select variety in having fewer awns and a slightly shorter straw. Its superior characters are high yield, stiff straw, and awnless kernels.

Comewell is a pure line from the old variety known as Welcome. The superior characters of Comewell are white kernels, high test weight, and high yield. It is now one of the popular varieties in New York.

Empire is a pure line from the Big Four variety and has shown high yielding ability under New York conditions. Its adaptation is similar to that of Comewell.

Forward is a pure-line selection from the Silvermine variety, although it has a slightly longer kernel. It has been especially promising on the red clay soils of the Lake Superior region in Wisconsin.

Idamine is a pure line from the Silvermine variety, extensively grown under irrigation in southern Idaho. It probably produces whiter kernels than any strain of midseason oats.

Ithacan is a pure line from a commercial variety known as National. Its superior characters are high yielding ability and high test weight. Ithacan has been promising on New York farms.

Minota is a rather stiff, short-strawed, midseason variety. It is desirable where taller midseason varieties frequently lodge. Minota is grown in Minnesota, Illinois, Indiana, and other Corn-Belt States.

Standwell is a pure-line selection from the Lincoln variety, especially valuable because of its stiff straw. It is grown in New York on dairy farms where oats frequently lodge because of an abundant supply of nitrogen.

Upright is similar to the Scottish Chief variety and has a very stiff straw and excellent yielding ability. It is grown commercially in New York.

Wisconsin Wonder is a pure-line selection from the White Bonanza variety. It can be identified readily by its rather long twisted and sharply bent awn. Wisconsin Wonder is a standard oat in Wisconsin because of its high yield and stiff straw. It also is grown to some extent in adjoining States.

Tech is a pure line selected from the Culberson variety and is grown from fall seeding only. It can be identified by its black kernels and hairy culms near the nodes. Its superior characters are high yield, early maturity, and cold resistance. Tech is grown commercially in Virginia.

Lee is adapted for fall seeding only. This variety resulted from a cross between Winter Turf and Aurora. Lee matures about a week earlier and produces grain of better quality than the Winter Turf. It is being distributed to farmers in Virginia and Tennessee.

T. R. STANTON.

OUTLOOK Reports Are Basis for Planning of Farm Operations

The agricultural outlook reports issued by the department are coming to be widely used as a basis for production and marketing plans for farmers. Foresight, based on economic facts, is the main objective, and outlook statements are designed to summarize the best available information bearing upon conditions which farmers will probably face when products of the coming season's operation are ready for market. The national outlook report is devoted principally to nation-wide and world-wide conditions bearing upon the supply and demand for the principal farm products, with analyses of the trend and production in prices and the probable effect of present trends on markets of the future. They are statements based upon the probabilities which experience and research have shown to be most likely to occur. They are summarized in convenient form to be placed before extension workers and farmers who are not individually in a position to gather and analyze the vast number of facts which must be reviewed to reach an intelligent conclusion. The outlook statements are prepared by the staff of the Bureau of Agricultural Economics working in cooperation with representatives of the agricultural colleges, experiment stations, and extension services. Representatives of 21 States participated in the preparation of the report for 1928. The facts regarding each commodity are first analyzed by specialists who work as committees on each product. These reports are then finally considered by a larger group, which represents all important branches of agriculture, in the annual outlook conference which extends through a week during January of each year.

The 1928 agricultural outlook report was the sixth of these reports to be issued. Each year they have been given a wider distribution and more farmers have become acquainted with the outlook idea. These reports are distributed by the Federal bureau through the extension service, the press, the radio, through cooperative associations, trade organizations, country banks, and other agencies.

The outlook is brought close to local farm conditions by the special State outlook reports which are based to a large extent on the facts carried in the Federal report. Such State reports are now prepared for 25 States and are distributed to farmers in those States through the county agricultural agents and in some States at special farm-outlook meetings. Some States hold meetings in nearly every county in which the outlook is presented to groups of farmers. Other States hold regional meetings for groups of counties, and in those meetings the probable markets for the products of the region are discussed and plans for farm adjustments are outlined in detail.

A Program for the Year

These reports constitute a program for the year's business, starting early in the year, and they are supplemented later by the information distributed through the market news service and other channels to enable farmers to correct and shift their plans as the season progresses. Through the system of local meetings, tens of thousands of farmers have been aided in making farm plans. To be of greatest use to the farmer, the outlook needs to be presented by an extension worker who is familiar with local conditions and can show the individual farmer how to adapt the recommendations to his particular conditions.

The outlook work is broader than the mere annual summarizing of the situation at the first of the year. As the season advances and new information is secured, other outlook statements are prepared, modifying the annual statement as may be necessary. For instance, when the intentions-to-plant report becomes available in March, a revision of the outlook in the light of these reports is issued; when the June pig survey results are available, the midsummer hog outlook is prepared. Other statements on beef cattle, lambs, and other commodities are featured during the summer, and in early fall a special outlook statement on winter wheat is prepared following the fall survey of intentions to plant. The agricultural outlook reports are, in fact, the final product from the bringing together of a vast amount of information which the individual farmer is not in a position to analyze even if it were possible for him to gather it. It forms a basis for him to begin more intelligent planning of both production and marketing in so far as he can meet changing conditions by making shifts and adjustments on his own farm.

It is recognized that adjustment by farmers alone can not insure satisfactory returns and that economical production is still a primary essential. The outlook report provides a basis for developing intelligent foresight, which is essential on the business side of farming. It provides the facts which should underlie production and marketing campaigns by cooperative organizations as well as by individuals.

The outlook work is as yet in its introductory stages. Many facts that are needed are not yet available. The facilities for gathering and analyzing information need to be steadily extended. Extension agencies have a large task in carrying the information back to farmers and in adapting it to their needs; but the accuracy of these statements of probabilities during the five years' experience has proved that it is possible, to a certain extent, to anticipate the future in view of what has happened in the past. As we secure more facts and learn to analyze them better, even a higher degree of accuracy may be attained.

Practical Significance of the Reports

Most of the statements presented in the outlook are facts which must not be ignored if the producer is to avoid periods of severe price depression. For example, with the statement of the fact that the production of certain farm crops is rapidly running ahead of the growth of consumption, little argument is needed to show that if these trends are continued prices must decline as surpluses increase and the producer will suffer. Through the outlook work the Federal department, in cooperation with the States, seeks to place before each farmer cold facts rather than mere opinions to aid him in making the budget for his own farm. The outlook does not provide working plans for individual farmers. Every farmer must, in the last analysis, decide for himself what he will do. The object is to help him to make the best possible decision under the circumstances.

The Federal outlook report is intended to be the basis of further studies and analyses to be made by the workers in various States and in different agricultural regions, since it is recognized that the plans of farmers must be adjusted to meet local conditions which in many instances can not be included in detail in a national report. The effort is to help farmers avoid losses which may come from extreme changes in acreage, in the breeding of animals, and in marketing in so far as they may be anticipated in advance. The Federal report for the Nation as a whole will not apply to local conditions in some localities, and each farmer must acquaint himself with these conditions to be able to use the report with best results. He must follow continually the changes as reported through crop reports, market news, and agricultural situation statements, since the outlook is continually changing as new situations develop. It is only through such careful study that reliable foresight is developed.

LLOYD S. TENNY.

OYSTERS are High in Food Value; Vitamin Content Exceptional

Oysters are the most valuable fishery product of the United States. The annual yield in this country is about 30,000,000 bushels. In former years oysters were prized chiefly because of their delicate and appetizing flavor. Newer knowledge in the field of nutrition has revealed the fact that oysters have also a high food value.

Oysters are a valuable source of mineral constituents that are essential for the health and normal nutrition of animals. Such diseases as rickets, goiter, and anæmia are closely associated with a lack of the proper quantities of lime, phosphorus, iodine, and iron in the diet. Oysters contain all these elements, collected from that vast chemical storehouse the ocean. They also contain other elements that may play equally important parts in physiological welfare.

Vitamins, the most recently discovered food factors, are well represented in oysters. Investigations just completed in the Bureau of Chemistry and Soils have shown that as a source of vitamin B (the antineuritic vitamin), oysters compare favorably with other foods that are recognized as excellent sources of this vitamin. Lack of vitamin B in the diet promptly results in loss of appetite and arrest of growth, which is followed by various nervous and functional disorders, commonly manifested in man as beriberi and as poly-

neuritis in fowls and animals. Oysters were also found to be a good source of vitamin A (the antiophthalmic vitamin). Without this vitamin young animals soon stop growing and become less able to resist disease and infection. In many animals a specific and characteristic affliction of the eyes results. Vitamin D (the antirachitic vitamin), which among other functions controls the deposition of mineral constituents in bone development, particularly lime and phosphorus, is well represented in oysters. It has been shown elsewhere that oysters are a good source of vitamin C (the antiscurvy vitamin). There are but few other foodstuffs, if any, which contain such a full complement of the different vitamins in significant quantities.

Protein is the most important food constituent. No living organism exists that does not contain protein as an integral part of its composition. Feeding experiments with young animals (albino rats) in which ground, dried oysters furnished the sole source of protein in the diet showed that the proteins of oysters were of good nutritional quality and were well assimilated. The dried oysters contained 48 per cent crude protein. Rats have grown at a fair rate through two generations on a diet containing no protein other than that of oysters. Although females of the first generation reproduced, they were unable to rear their young. There is evidence indicating that this failure was due, not to any deficiency in the nutritive property of the proteins, but rather to a low content of vitamin E (the antisterility vitamin) in the diet.

D. Breese Jones.

PAPER Mulch Helps Plants and Checks Weeds in Gardens The agricultural use of an impervious-paper mulch first attained economic importance in the pineapple plantations of Hawaii about five years ago. Since then its experimental use has extended to widely separated regions of the world, with the result that the mulch has proved to be effective as regards plant stimulation and weed control with a variety of crops grown under differing conditions of soil and climate.

These results, however, do not in themselves assure the profitable extension of the paper-mulch practice to other crops and regions. The possibilities of such an extension involve so many variable factors of soil, labor, and market conditions as to prevent any satisfactory general evaluation.

A more precise knowledge of the biophysical features of the paper mulch appeared essential to the efficient study of its practicability in various phases of agricultural activity and is the object of a series of experiments undertaken by the department. It appears quite rational to expect an economic future for the mulch in the growing of certain types of plants in certain localities. Such an economic future will be realized only through developments with particular crops in various sections by practical growers who may be interested in carrying out small-scale experimental trials. One of the suggested ways in which paper mulches may prove of value to agriculture is in connection with the home garden.

The paper-mulch experiments of the department have been carried on throughout four seasons, during which the mulching system used in Hawaii for pineapples has been gradually adapted to other crops and conditions. In the most promising trials an asphalt-coated and

saturated paper similar to the pineapple mulch was used in strips 18 inches wide held down over slight ridges by heavy wire staples placed at 5-foot intervals. All crops were planted in rows 18 inches apart, and the seeds or plants were put in along one edge of a strip, the next strip being then laid alongside at a spacing of about an inch. When the paper was thus laid it practically covered the entire area and

FIG. 168.—Adaptation of paper mulch to home garden crops in experimental trials at Arlington Experiment Farm, Rosslyn, Va., in 1927. A, method of laying the paper mulch for home garden crops. B, stimulation of home garden crops by use of the paper mulch; a later view of the area of A

operated at a maximum in absorbing heat, retaining soil moisture, and keeping down weeds. One could readily walk upon it to do the necessary hand weeding, thinning, and harvesting. It eliminated all weeding and cultivation between rows.

Strength of Paper Used

The paper used in these trials was designed for a tensile strength to carry it through the several years' duration of a pineapple plantation. It is possible that a cheaper paper would serve as well for annual

crops, and experiments are being conducted with such papers. On the other hand, the heavy paper when laid in the above-described manner may readily be rolled up in the fall and stored for subsequent use during a second or even a third season. In some sections it stood up well for three years when left out of doors continuously, as when used, for example, as a mulch for strawberries. Furthermore, the partially torn sections unsuitable for row mulching have proved valuable about berry bushes and fruit trees. On account of these facts the paper used in these trials may prove quite satisfactory in the home garden.

There are three outstanding physical features of an impervious black-paper mulch—it increases the soil temperature, it reduces the loss of soil moisture, and it modifies the distribution of the water supply. During the day the absorption of the sun's rays by the black paper often increases the temperature of the soil beneath by 10° or more, while during the night the paper retards the radiation of this absorbed heat to such an extent that the soil temperature may often

FIG. 169.—Paper mulch trials at Arlington Experiment Farm. The home garden crops on the right were planted on the same date as those of the unmulched plants on the left. The paper stimulated vegetative growth, hastened maturity, and increased the yield

be several degrees higher on the mulched area. The paper reduces the loss of soil moisture by reducing the evaporation from the soil surface and by conserving the moisture which might ordinarily be given off by weed growth. The paper modifies the distribution of the water supply in two ways—it carries the rain water directly to the region of the plant roots, and it holds available moisture in the top layers of the soil. While it is quite likely that the paper mulch has an important influence on the growth of microorganisms and on the available food supply, these changes may be considered as brought about by the increased temperature and moisture characterizing the topsoil of the mulched area.

Experiments at Arlington

During four successive seasons the influence of the paper mulch upon various crop plants at the Arlington Experiment Farm has been definite and appreciable. (Figs. 168 and 169.) The early experi-

ments followed the mulching system used with pineapples, but this method was soon adapted more effectively to vegetable crops by the use of a block mulch system practically covering the soil. By placing the seeds or plants between the rows of paper held with long wire staples the paper was kept more nearly intact for repeated use with other crops in the same season and in other seasons. Moreover, the Hawaiian system of mulching makes use of separate mulched rows with soil areas in between which have to be kept weeded for a time. The block system devised and used in the course of these trials eliminates all weeding and cultivation between the rows.

While the plant response to the mulch has been definite and appreciable with most crops, there were differences in the nature of this response. With crops such as lettuce, okra, cucumbers, and melons, the germination was hastened to such an extent that it was not unusual to have a substantial showing of plants on the mulched area before any of the unmulched plants were visible. Moreover, in addition to an increased rate of germination, in some cases, particularly on heavy soils which formed crusts upon drying, the total germination was increased by the mulch, inasmuch as the soil surface was kept moist by the paper and was thus easily penetrated by the young shoots.

Growth Made More Rapid

As regards vegetative development, the mulched plants characteristically made the more rapid growth and maintained an appreciable advance over the unmulched plants until maturity. With crops such as beets, carrots, and Swiss chard, when grown on fertile soil the final heights of the mulched and unmulched plants were not significantly different, the control plants eventually catching up in vegetative growth. In such cases the outward differences became effaced, with only the hastened maturity and increased yield showing in the final tabulations. In other cases when these same crops were grown on relatively poor soil the unmulched plants never attained the vegetative development which characterized the mulched plants. With crops such as green beans, okra, and sweet corn the unmulched plants never attained the height growth of the mulched plants, even on fertile soil.

The influence of the mulch on the hastening of maturity was especially marked with some crops. The result of three successive seasons with potatoes, for example, showed that flowering occurred from 7 to 18 days earlier on the mulched plants than on the unmulched plants of the same age. With sweet corn on light but fertile soil the peak of the yield came about 10 days earlier with the paper mulch. In general the paper hastened the maturity by from 7 to 14 days, a feature more important in market gardening than in the home garden, but nevertheless advantageous, especially in regions where more than one crop is grown on the soil in a single season.

Influence on Yield

The influence of the paper mulch upon the yield was variable with different crops, yet generally definite and appreciable. With tomatoes and potatoes the yields for three successive seasons were increased 33 per cent. With green beans during a similar series of trials the yield was increased 66 per cent. With other crops the

percentage increases were variable with the soil, and the trials have not been repeated sufficiently to indicate the increase which may reasonably be expected from the use of the mulch. These increased yields, however, have in general tended to exceed 33⅓ per cent, and on poor soils have frequently been more than 100 per cent. The maximum increases were obtained with sweet potatoes, which for three successive seasons were of the order of 150 per cent favoring the mulch. In this crop, however, the paper probably has an additional value through preventing the rooting of the runners.

In many sections home gardens are sometimes subject to a dearth of water. The water-retaining feature of the impervious-paper mulch together with its property of carrying all water supplied through rain or sprinkling directly to the region of the plants makes it of value in affording a more efficient use of the water supply.

The increased-temperature conditions characterizing the use of the black paper make possible the extension of the northern limit at which certain crops may be successfully matured. While such an extension may not be practical on a commercial scale, it may become an asset in the home garden by adding to the diversity of the crops grown.

There are obvious disadvantages associated with the use of the paper mulch. It is expensive, it is somewhat troublesome to lay, and it stimulates the growth of weeds within the rows. The disadvantages, however, may be reduced as extension of the practice continues. Certainly in some instances the advantages will outweigh them, and it is quite possible that the impervious paper mulch may prove as successful in the home garden as it has in the pineapple plantations of the Hawaiian Islands.

L. H. Flint.

PASTURE Problems in Coastal Plains Region of South The Gulf coastal plain of the Southeast is the largest remaining area in the United States available for expanding the production of beef cattle. Western ranges have long been depleted by overstocking, and central and eastern farm lands close to central markets are better adapted to producing feeds for finishing animals grown locally and in other sections. The coastal plain contains a vast area of cut-over pine land one-fourth as large as the present crop-producing area of the United States.

In spite of the apparent presence in portions of this region of an enormous supply of forage, cattle raising has never become an extensive business there and the cattle produced have been of such low quality as not to compete seriously with those of any other cattle-raising section. With an economic advantage of nearness to the great consuming centers and the natural advantages of a growing season of from 240 to 270 days, and an annual rainfall of about 60 inches fairly well distributed throughout the year, it requires an analysis to understand why cattle grazing has not been greatly on the increase. Although the cattle-fever tick has been largely responsible for the lack of improvement in the quality of the cattle, it does not account for a lack of increase in numbers, as cattle raised among the ticks become immune from death losses from the fever.

Forest Grasses Not Adapted to Intensive Grazing

The history of cattle and similar grazing animals throughout the world, both in the wild state and under domestication, shows that great herds of grazing animals developed only in the treeless plains such as existed in parts of Asia, northern Africa, and Russia. Only in comparatively recent times have centers of cattle production grown up in forested countries and then only after the forests had been cleared away and pastures of sun-loving plants provided for domesticated animals.

While the cattle industry west of the Mississippi River has reached great proportions with no attention to pasture improvement, that east of the Mississippi has prospered only as the forests have been cleared away and introduced plants have been established for pastures. Such plants as bluegrass, timothy, white clover, red clover, alfalfa, and numerous other pasture plants were introduced to this country from northern or central Europe, where they had been in cultivation for centuries in a climate similar to that of their new habitat. Bluegrass was introduced by the early French settlers and at the time the English settlers reached the Ohio Valley they found it already spread there and established to such an extent that they considered it native.

Bluegrass and timothy have spread naturally far to the north and west of the localities where they were originally introduced, while the clovers and alfalfa are under cultivation in practically the same area. But these grasses struck a dead line extending east and west through Tennessee and advanced no farther south. Attempts to cultivate the northern-grown grasses and clovers have been desultory in the South and nowhere have they established a permanent place in the pastures. The natural boundary line of their volunteer spread is sufficient warning that they are not likely ever to succeed farther south.

Introduced Plants from Warm Climates

Failures to succeed with the pasture grasses of the North and disappointing results in grazing the native grasses have given pastures of the South a bad reputation. This to a great degree accounts for the lack of livestock in the southern system of farming. But in the meantime accidentally introduced plants have gradually spread voluntarily and given the clew to further pasture-improvement work. The first was Bermuda grass, which spread rapidly over the heavier clay and alluvial soils. Next to attract attention was lespedeza, a legume accidentally introduced from Japan and now scattered throughout the South and coming into recognition as its most valuable legume for pasture and hay. More recently carpet grass, an accidental introduction from the West Indies, Central America, or South America, is proving its exceptional value as a turf grass of very high carrying capacity. Other introduced grasses, such as Dallis grass and Vasey grass, are now receiving attention and with these grasses have come bur clovers, hop clovers, black medic, and vetches, as well-adapted legumes most valuable in pastures. Carpet grass, Bermuda, (fig. 170) and lespedeza now form the basis of practically all the improved pastures in the South Atlantic States and Gulf coastal plains.

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Following the hints given by nature, the Department of Agriculture is now searching other parts of the earth of about the same lati-

FIG. 170.—Cattle grazing on carpet grass pasture in December

tude for pasture plants to try out experimentally in the South. Numberless grasses and legumes from lower Asia, the great game regions

FIG. 171.—Cattle grazing on reforested land. Note the thin stand of grass

of Africa, and the grazing regions of South America yet remain to be tried. Centipede grass, a recent introduction from China, has

already been tried out and is being recommended for planting. Many other introduced plants show considerable promise.

Experimental figures during a period of 10 years show that the native forest grasses (fig. 171) grazed at the rate of one head to 10 acres do not afford sufficient grazing to support a cow with calf at side after July 1. On the other hand, carpet-grass and Lespedeza pastures will carry one mature animal per acre with continuous gains for a period of nine months and will afford some grazing throughout the winter months. Widespread tests on a considerable acreage confirm the high carrying capacity possible to attain on pastures suitably planted.

The adaptation of forest grasses to intensive grazing appears to be contrary to a fundamental law of nature which supplied sun-loving, turf-forming grasses to support grazing animals on the treeless plains. For the South, which was originally a forested country, this means that pastures must be built from plants brought in from other parts of the world.

S. W. GREENE.

PEACH Orchards in Georgia Menaced by Phony Disease About 50 years ago Samuel H. Rumph, the originator of the Elberta and several other important commercial peach varieties, observed a few dwarfed peach trees in his orchard at Marshallville, Ga. These trees he called "ponies" because of their small size. The number of trees showing the dwarfing tendency continued to increase in Doctor Rumph's orchard and in the neighboring orchards, and the trouble was known as "pony peach." Various causes were assigned to this behavior, and finally it came to be regarded as a disease. The name "phony disease" has also been applied, and this term is in general use at the present time.

In 1900 an occasional phony tree was seen in the peach districts near Marshallville and Fort Valley, Ga. In 1915 in these localities the trouble had increased to the extent that orchardists became alarmed and the United States Department of Agriculture was called upon for assistance. In 1921 special investigations were begun by the Bureau of Plant Industry to determine the cause of the disease and methods of control.

The present known occurrence of the phony disease is limited to Georgia, where it has invaded nearly all of the commercial peach-growing districts of the State. Occurrence is recent and slight in the northern sections. During the last three years it has become serious in the north-central and west-central counties, and it has been for several years a great menace in the extensively planted central region, where practically every bearing orchard has diseased trees and it is not uncommon to find 50 per cent or more of the trees diseased in orchards that have reached 8 years old.

Increasing in Southern Area

In the southern part of the peach belt it is only moderately serious, but is increasing. In one of the southernmost orchards, consisting of 2,000 trees, situated on land entirely new to peaches and in a totally new peach district, the particular orchard being 15 miles

from any other planting of peaches, 3 per cent of the trees, now 5 years old, are typically phony. Taking into consideration trees of all ages for the entire State, it is probable that about 5 per cent are in various stages of the phony disease. The highest individual occurrence records show 60 per cent of diseased trees in an orchard 4 years old and 99 per cent in an orchard 12 years old.

Initial characters of the phony disease do not appear in commercial plantings before the latter part of the second growing season in the orchard, or three seasons from the bud. Thereafter, trees may come down with the disease at any age, and the first symptoms may become evident at any time between May 1 and September 15 of the year that the disease develops.

With the onset of the disease a phony tree develops shortened internodes, a large number of lateral twigs, and large, flattened,

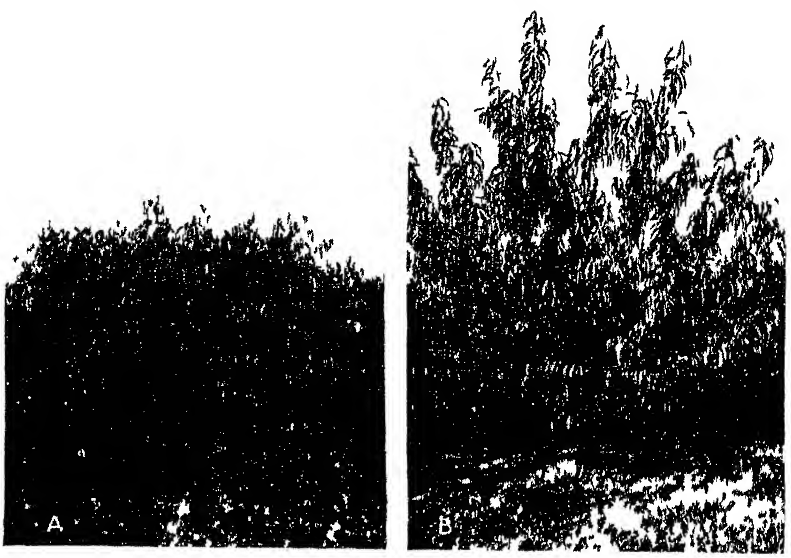

FIG. 172.—Phony disease of the peach. Trees of the Hiley variety completing third year's growth in the orchard. A, tree in the first year of the phony disease; B, normal tree. Fort Valley, Ga.

dark-green leaves, giving the appearance of compact, dense growth with very healthy foliage. (Fig. 172.) Especially in young trees, decided dwarfing results, and normal trees quickly exceed phony trees in circumference and height. The annual terminal twig growth of a phony tree may be only from 1 to 6 inches, as compared with a terminal growth of 1 to 3 feet or more in normal trees. The phony condition may advance the blooming, leafing, and fruit-ripening dates a few days, and it may retard the time of autumn leaf fall. In advanced cases, phony trees may be identified in the dormant condition by the short terminal and the profuse, short, lateral twig growth. In such trees, because of the condensed appearance of the growth, the disease is usually evident at blossoming time and with the first mature leaves in the spring.

Phony trees do not seem to be more subject to winter injuries than are normal trees, and they may live many years after showing the symptoms of the disease. However since the terminal growth

is short, it is difficult to shape the phony trees by pruning to stimulate new growth, and as large limbs die they are not replaced by the tree. After four or five years of the disease the trees are generally ragged and there is apt to be a marked dying back of terminal twigs and branches. Trees are on record that have had the disease seven years and are still living.

Effect on the Fruit

With each additional year after the symptoms of the disease appear there is a notable decrease in the average size of fruit and in the number of fruits to the tree. At Fort Valley, Ga., for the Hiley variety, a normal tree 8 years old may bear 1,000 marketable fruits, while a phony tree of the same age that has had the disease five years may bear 50 fruits, mostly too small to be marketed. It is not unusual for the size of normal fruit to be about two and one-half times that of diseased fruit.

Fruit from phony trees is apt to be distinctly poorer in flavor than normal fruit, though slightly better in color. The seeds of phony peaches are small, but the kernels are well formed and they give a high percentage of germination. In an experiment, seedlings from phony seeds have not developed the disease after three seasons of growth.

The disease is not believed to be limited by ecological factors in its distribution in Georgia. It occurs on old and on new land, on all soil types within its range, and is apparently independent of cultivation, drainage, cover crops, and chemical fertilizers. Orchards that show numerous cases of this disease in young trees may be found on land not previously planted to peaches. Diseased trees do not recover when transplanted. Replants do not seem to contract the disease more easily when planted in holes from which phony trees have just been removed.

By detailed and extensive mapping of orchards over a period of several years, it has been shown that this disease does not spread in colonies in the manner that such contagious diseases as peach yellows are known to do. The new cases for any given year are scattered and seem to have no relation to previously existing cases in the same orchard. There is a popular belief that this disease is more prevalent near buildings or when stable manure and other highly nitrogenous fertilizers are applied to the land. Extensive observations, however, tend to show that in well-fertilized trees the characters of the disease are so pronounced as forcibly to attract attention, and that the casual observer overlooks definitely positive but less conspicuous cases scattered over the portions of a planting that are less favorably situated for luxuriant growth.

Cause Remains Unknown

The phony disease has been found occurring naturally only in the peach, and its cause remains unknown. It attacks alike seedling trees and trees of all commercial varieties grown in the State. Though wild plums (*Prunus angustifolia*, *P. umbellata*, and others) are abundant near commercial peach orchards, the phony condition has never been observed in them. Attempts to transmit the disease by injection of juice expressed from various parts of phony trees have failed.

When buds or scions from phony trees are budded on nursery trees or on normal peach trees, the resulting growth is invariably normal and the disease is not transmitted. When similar experiments are performed, using normal buds or scions on phony trees, the resulting growth is always typical of the disease.

Furthermore, in experiments where Peento and Honey peach types, *Amygdalus davidiana*, and commercial varieties of almond, apricot, and nectarine were top-worked on phony trees, the resulting growth was much dwarfed and developed leaf and twig characters typical of the phony disease. The dwarfing effect was particularly striking in the case of *A. davidiana* Growth of this species when

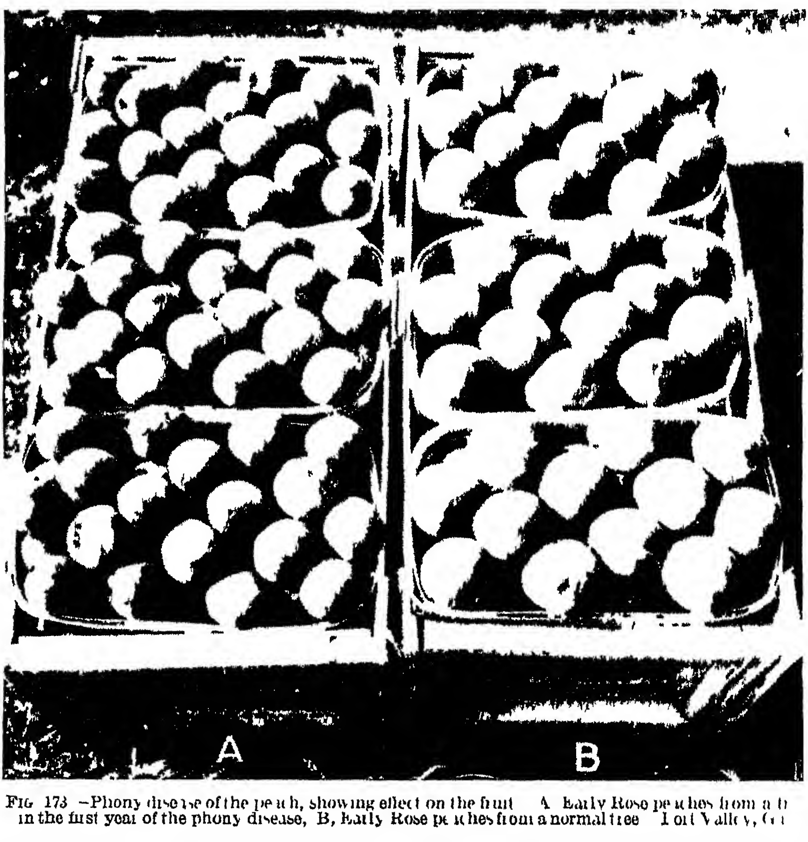

FIG. 173.—Phony disease of the peach, showing effect on the fruit A, Early Rose peaches from a tree in the first year of the phony disease, B, Early Rose peaches from a normal tree Fort Valley, Ga

grafted on normal peach trees was in some cases 10 feet in one season, as compared with a bushy, profusely branched growth of 18 inches when grafted on a phony tree. Not only does it seem possible that the phony disease may invade peach-growing districts beyond the borders of Georgia, but the experiments just described suggest that the disease might also attack fruits closely related to the peach if introduced into the districts where they are grown.

The fact has been repeatedly established by experimentation that the dwarfing effect in the top growth is only a symptom and secondary, and that it is produced by diseased roots. Whether it may be due to an infective principle or to a purely physiological disturbance is not

yet certain, but the evidence of recent experiments indicates strongly that it may be due to an infective principle residing in the roots. In each of the leading commercial varieties observed, a very small percentage of trees in badly diseased orchards appear to be resistant to the phony disease, and year after year they continue to grow normally, even though surrounded by old phony trees. This behavior has suggested the possibility of selecting resistant stocks as a control for the phony disease, and extensive investigations are being carried on at the United States peach-disease field laboratory, Fort Valley, Ga., with this in view.

There is every reason for thorough and intensive effort to control the phony disease. Although its communicability has not been definitely established by experimentations, it has already traveled 200 miles from its point of earliest recorded observation, at Marshallville, Ga., and has increased from commercially unimportant numbers 30 years ago to such proportions that at the present time it threatens a great industry.

LEE M. HUTCHINS.

PEANUTS a Valuable Food for Man and Feed for Livestock Peanuts are commonly associated in our minds with circuses, fairs, and gala days. That they constitute excellent feed for livestock, as well as food for man, is generally far too little appreciated. Peanuts are not nuts as the name might suggest, but with peas and beans belong to the legume family. They have, however, a nutritive value far superior to beans, with the possible exception of the soy bean. As a feedstuff, every part of the peanut plant can be used to advantage. The vines, properly cured, constitute a hay with a feeding value equal to or better than clover or alfalfa. Shelled peanuts contain from 40 to 50 per cent of a highly digestible oil that compares favorably with olive oil for culinary purposes. The press cake which remains after expelling the oil from whole peanuts, and which is generally ground and marketed as peanut meal, contains from 31 to 38 per cent protein; and when it is obtained from choice shelled peanuts, may contain as high as 58 per cent. Peanuts are also a good source of vitamin B.

The nutritive value of a protein is dependent on two factors, its digestibility and quality. Scientific experiments have shown that peanut proteins are not only highly digestible but that they rank among the highest in quality. The so-called nutritional quality of a protein depends on its chemical composition. Most proteins when digested yield 18 or 20 substances called amino acids, several of which are essential for the normal growth and nutrition of animals. Proteins of poor quality are those that are lacking or deficient in one or more of these essential amino acids.

Work recently done in the Bureau of Chemistry and Soils has shown that peanuts contain two proteins—arachin and conarachin. Both of these proteins contain all of the known essential amino acids. Arachin is conspicuously high in lysine (5 per cent), and conarachin, in cystine (3 per cent), two of the essential amino acids. The chief proteins of the cereal grains are deficient in lysine and cystine. Peanut meal or peanut press cake therefore serves as an excellent concentrate for mixing with corn or cereal feeds to supplement their deficiencies.

Gives Excellent Growth Results

In experimental feeding tests excellent growth of animals resulted when fed a ration containing 3 parts of whole, yellow corn meal and 1 part of peanut meal as the sole sources of protein. On the other hand, with a ration containing corn as the only source of protein, nutritional failure resulted.

The value of peanut proteins as supplements to wheat proteins was similarly demonstrated. A highly digestible and palatable bread can be made from a mixture of peanut flour and wheat flour. A diet containing bread made from white wheat flour as the sole source of protein promoted growth at only one-third to two-thirds of the normal rate. A similar diet containing bread made from 25 parts of peanut flour and 75 parts of wheat flour furnished proteins adequate for normal growth.

From a nutritive standpoint, peanut meal is one of our cheapest and best protein concentrates. On account of its high content of protein it can be utilized best by mixing it with foods and feedstuffs which have a lower biological value to supplement their deficiencies. The results of scientific investigations indicate that peanut proteins have a nutritive value nearly, if not quite, equal to that of the proteins of meat, milk, and eggs.

D. Breese Jones.

PECAN Production Expanding; Crop Now of Trade Importance

Rapid extension of pecan orcharding throughout much of the South for the production of the superior thin-shelled nuts, and increased yields from the native forest trees through the clearing out of other growth, have greatly increased the total production of pecans. Accordingly the crop has assumed commercial importance. About 64,000,000 pounds of pecans were produced in 1926, the largest crop of record, with an estimated value of about $9,000,000. Of this crop, over 10,000,000 pounds, with a value of almost $4,000,000, were of improved varieties.

The pecan is indigenous to the river valleys of Texas, Louisiana, and Mississippi and to the valleys of the Mississippi River basin northward to southeastern Kansas, central Missouri, southeastern Iowa, and the southern parts of Illinois and Indiana. There was no adequate commercial demand for the nuts until recently and for almost 100 years the trees were ruthlessly cut for timber or to clear the land.

The pecan tree is of sturdy growth and is long lived, and some specimens are extraordinarily fruitful. It succeeds well in the fertile river bottoms or near the coast, in situations free from excess of alkali or salt. According to the United States census, the number of trees of bearing age increased 65 per cent from 1910 to 1920 and 65 per cent from 1920 to 1925. Practically all of the gain was in trees of improved varieties.

Proportion of Bearing Trees

The proportion of trees of bearing age was 49 per cent in 1910; 54 per cent in 1920; and 50 per cent in 1925. In the native pecan

belt about 58 per cent of the trees were of bearing age in 1925, whereas in the South Atlantic and East South Central States, where the trees have all been planted, and mostly within the last 30 years, the proportion is reversed, about 58 per cent being of nonbearing age.

Wild seedlings form the great majority of pecan trees in the areas of native growth. Improved varieties are becoming common in these States, but the important commercial plantings have been made mainly in the coastal plains eastward and northward from the Mississippi to the Carolinas. Texas has about two-thirds of all the wild pecan trees in the United States. In 1926, its record year, Texas produced fully 32,000,000 pounds of nuts, or 50 per cent of the total crop. Large numbers of native trees still remain in the forests of Mississippi, Louisiana, Arkansas, Missouri, and Illinois.

In States where the pecan has been introduced most of the plantings consist of improved varieties; that is, budded, grafted, or topworked trees. Single orchards frequently have thousands of trees and some contain 10,000 or more. In commercial pecan orcharding Georgia has shown the most striking development. Production of nuts in that State reached nearly 7,000,000 pounds in 1926.

Estimated Totals of Bearing Trees

The estimated total number of trees of bearing age, mostly improved, based mainly on census enumerations, is as follows: Georgia, 1,375,000; Florida, 280,000; and Alabama, 400,000. In addition to wild groves, Mississippi is estimated to have about 180,000 and Louisiana 50,000 orchard trees of bearing age. The total number of improved trees of all ages in the United States is estimated at about 4,500,000. More than 5,000,000 native seedling or wild trees are shown by the 1924 census, which probably fails to enumerate vast numbers of forest trees from which nuts are not regularly gathered, as well as many thousands of scattered trees for home use.

The great increase in the supply of nuts of fine quality through orchard development has brought the price down to a somewhat lower level than formerly. To date, yields per acre have mostly been well below expectations. Consequently, the heavy expenditures in planting and developing such orchards, on the assumption that high prices would continue to prevail, coupled with optimistic expectations for early bearing and heavy production, have resulted in disappointment to many who invested in such ventures. At moderate prices the market always seems to absorb the finer types of pecans, and lower prices vastly broaden the demand. Furthermore, pecan kernels are being used at a rapid rate of increase in the manufacture of various kinds of food products.

The average age at which domestic planted seedlings bear a crop that will pay expenses and a reasonable return on fair investment has been between 15 and 20 years in the Southeastern States. They have usually paid expense of gathering at 10 to 15 years. The improved trees have usually furnished a commercial crop, say a minimum of 5 pounds per tree, in about 10 years after the tree is set out, and a collectible crop in from 5 to 8 years. Improvements in varieties and in orcharding practices are tending to shorten the time.

Marketing Through Merchants

The marketing of the nuts in the native pecan belt is mostly through local merchants who ship to jobbers in the State centers or to the large handlers in San Antonio, New Orleans, St. Louis, and other cities, who redistribute the nuts or remove the kernel for use in candies or confections. The proportion of the wild crop gathered is dependent upon whether the crop is abundant or light, the price being paid, and the competing demand for farm labor, especially for cotton picking.

The industry has now reached the stage where materially increased attention to the matter of grading, and to making marketing plans more adjustable to the supply and demand situation, is greatly to be desired. Price ideas based upon a previous large crop may lead the grower to sell a moderate crop at too low a price. To hold a large crop for prices like those received for a small crop the previous year may cancel the advantage of the holiday demand or leave the nuts on the growers' hands. Frequent lack of information by growers concerning the supply elsewhere places them at a disadvantage. Selling agencies of the growers should be in position to analyze the available information and to decide these problems. Fuller information is needed by the industry concerning the prospects and production of the different types of nuts.

The logical plan of carrying over an unwieldy surplus of nuts from a season of very heavy production to be marketed the following season to supplement the expected short crop was followed with highly gratifying results on a large scale in 1926–27. Small crops usually follow bumper crops. When maturing a very heavy crop the tree tends to set relatively few fruiting buds for the next season's crop. Heavy crops are usually of good quality and the nuts keep well by the proper use of cold storage.

S. A. Jones.

PHOSPHORIC Acid of Higher Concentration Got by New Methods

During the last few years the production and utilization of concentrated fertilizer materials which contain two or more of the three essential plant-food elements—nitrogen, phosphorus, and potassium has been the subject of considerable discussion and investigation in the principal countries of the civilized world. From the points of view of physical and chemical properties and the ease with which they may be handled on the farm, the most promising of these concentrated materials are ammonium phosphate, potassium phosphate, and potassium nitrate. A large number of fertilizer mixtures, containing various proportions of the three major plant food elements, may be prepared from these three chemical compounds.

Nitrogen and potassium are readily available in forms suitable for the direct manufacture of concentrated fertilizer materials. On the other hand, our only important source of phosphorus is the insoluble calcium phosphate that is present in bones and mineral phosphate rock. In order to utilize these insoluble phosphates in the manufacture of soluble concentrated fertilizers, the phosphorus which they contain must first be converted into liquid phosphoric acid by some chemical process.

For a great many years liquid phosphoric acid has been obtained for food and technical purposes by treating insoluble calcium phosphates with the proper quantity of sulphuric acid. Formerly bones were used exclusively for this purpose, but mineral phosphate rock is the principal raw material at the present time. A fairly high grade phosphate rock is required in this process, and the product is a relatively dilute phosphoric acid which, owing to its cost of production thus far, has been able to compete only to a limited extent with superphosphate (acid phosphate) and other ordinary phosphate fertilizers.

Two Processes Developed

The investigations of the Bureau of Chemistry and Soils on the manufacture of liquid phosphoric acid have resulted in the development of two processes that are capable of producing pure, concentrated phosphoric acid from low-grade and run-of-mine phosphate rock. In both of these processes, mixtures of phosphate rock, sand, and coke are heated to a high temperature in a reducing atmosphere. The elementary phosphorus which is evolved from the furnace is oxidized by air to produce oxides of phosphorus. The oxides of phosphorus are converted into concentrated liquid phosphoric acid by passing the oxidized gases, in the presence of moisture, through an electrical-precipitation apparatus.

The two processes differ in the mechanical equipment that is required for their operation and in the method of heating the furnace. Electrically heated furnaces are used in one process and fuel-fired furnaces, burning either oil or coke, in the other.

The principal advantages of these new processes over the old process for the manufacture of liquid phosphoric acid are: (1) the direct production of phosphoric acid in concentrations most suitable for the manufacture of concentrated fertilizer materials, (2) the production of high-grade phosphoric acid that is easily purified for use in the manufacture of food products, and (3) the ability to utilize low-grade and run-of-mine phosphate rock. The latter is a factor of considerable economic importance, in view of the fact that approximately 4,000,000 tons of phosphate are lost or wasted annually during the process of treating the phosphate rock as mined, to obtain the high-grade material required in the old processes for the manufacture of phosphate fertilizers.

The new processes, particularly the electric-furnace process, are now producing approximately 75 per cent of the liquid phosphoric acid used annually in this country for the manufacture of food and technical products. Phosphoric acid produced in this country by these processes is not used for fertilizer purposes at the present time. However, it seems very likely that concentrated fertilizers containing volatilized phosphorus will be produced on a large scale in the United States in the near future.

K. D. JACOB.

PLANT-DISEASE Specimens Should be Properly Packed and Forwarded Much of the material received for identification by the Bureau of Plant Industry is in such bad condition that it can not be satisfactorily determined. Many specimens improperly prepared decay in transit. Others dry and shrivel up so as to be unrecognizable. In order to improve conditions in this respect and thus make it possible for the department to give better service to its correspondents, the following advice is given:

Plant-disease material intended for identification may consist of roots, stems, branches, leaves, fruit, or fleshy or woody fungi such as mushrooms and toadstools.

How to Send Material

Roots showing evidence of disease should be removed from the soil as carefully as practicable in order to keep them as nearly as possible in their natural condition. They should be wrapped at once in several layers of newspaper or other light paper and tied securely. They should then be wrapped in oiled or paraffined paper if available, in order to prevent too much drying out in transit. The outside wrapper should be of heavy wrapping paper, and the package should be securely tied with strong twine.

Stems, branches, and other woody material showing diseased conditions or fungi should first be wrapped separately in newspaper and then the whole bundle packed in a strong pasteboard box, corrugated pasteboard, or several layers of strong wrapping paper.

Such material as herbaceous stems and fresh leaves should be spread out and pressed between several layers of newspaper or blotting paper and then wrapped in a flat package between pieces of heavy pasteboard.

Fleshy fruit should first be wrapped loosely in soft paper and then packed loosely in a strong pasteboard carton or a wooden box with excelsior or bunches of soft paper between to prevent shaking about or crushing of the specimens.

Fleshy fungi such as mushrooms and toadstools may be packed in the same way as fruit, but as they are more perishable than most fruits, they can not be sent long distances without becoming spoiled in transit. In such cases a description should be made of the color and other characteristics of the plants and then they should be dried in the sun or over a slow fire before packing.

Addressing and Forwarding

All packages should be addressed to the particular office in the Bureau of Plant Industry (Washington, D. C.) for which they are intended. The sender's name and address should be plainly written on both outside and inside of the package.

Packages may be sent by parcel post or express, whichever is cheaper or more convenient.

C. L. Shear.

PLANT-DISEASE Survey Covers Country in Information Service It may not be generally known that the Department of Agriculture conducts what might be called a public health service for plants—that, reaching into every State, there is an organization whose object is to watch for and report the occurrence and prevalence of plant diseases. Through this organization the department is informed of any new or dangerous diseases that may appear, learns of epidemics, records and maps the geographic distribution of diseases, estimates losses, and collects other field data as well as diseased specimens. The organization that does this work is the plant-disease survey of the Bureau of Plant Industry.

The plant-disease survey is a cooperative undertaking which enables State and Federal plant pathologists to attack their problems more effectively. It started in 1898, when the present Director of Scientific Work of the department, A. F. Woods, prepared a brief article on the plant diseases of the year which was published in the Yearbook. The project was carried by the office now called the Office of Vegetable and Forage Diseases and later by the Federal Horticultural Board until 1917, when it was given an independent status in the Bureau of Plant Industry.

Broadly speaking, the work of the survey falls into three main classes, namely, the collecting, the recording, and the summarizing of plant-disease information.

Voluntary Collaborators Exist

The collecting is done largely through a system of voluntary collaborators who, for the most part, are the plant pathologists of the State experiment stations and agricultural colleges. They are usually appointed by the department to serve without compensation. At the present time there are 215 such collaborators in the various States and in Cuba, Porto Rico, and Haiti. In each State one person is usually designated as chief collaborator and it is with him that the Washington office keeps most closely in touch. He is supposed to organize the survey in his State as seems best for local conditions. In some cases this local survey is highly developed with a corps of voluntary reporters and correspondents. In others the organization is limited either by lack of reliable reporters or by insufficient available time on the part of the collaborator. Experience has shown that the best observations are those made directly by the plant pathologists themselves or by other workers who have had special training in plant pathology.

Collaborators are requested to furnish information to the Washington office twice monthly during the growing season, and at the end of the year they are expected to submit an annual report on diseases in their respective States. Other pathologists, botanists, and agricultural specialists are asked for whatever information they can contribute. Also, the current literature is scanned and specimens that have come into the Bureau of Plant Industry are noted. In short, it is sought to obtain information from all possible reliable sources.

Field Men Appointed

In 1926 the survey appointed a field man to assist collaborators in one of the States, and in 1927 another field man was added. Each of

these men confined his activities to a single State. They organized the existing forces for reporting diseases, and each spent a considerable amount of his time in the field making diagnoses and estimates, recording his observations, collecting specimens, and giving first aid to the growers and county agents. Although these men have been confined to a limited area when the entire United States is considered, they have made valuable observations and discoveries and have greatly assisted in the agricultural programs of the States by delimiting the plant-disease problems of most importance.

Extensive Files Maintained

The recording of the information thus collected is done in the Washington office, where files are maintained showing plant-disease occurrence, prevalence, losses, etc., both in this and in other countries. These files are available to anybody who wishes to use them. They are of special value to investigators who desire information pertaining especially to distribution and damage, and for references to the already extensive and rapidly increasing literature. During 1926 a total of 13,286 individual disease reports were added to the file of domestic plant diseases.

Information Summarized in Washington

The information obtained is summarized in the Washington office and distributed mostly through the Plant Disease Reporter and by

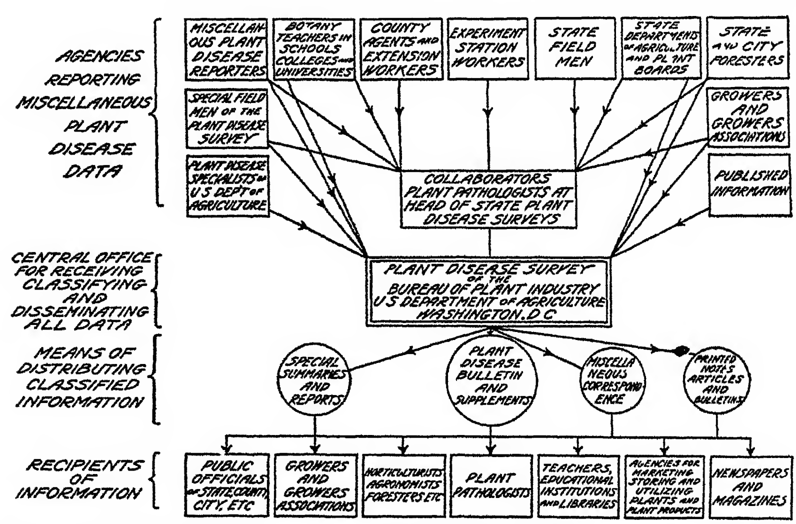

FIG 171.—Plant-disease information service as conducted by the plant-disease survey of the Bureau of Plant Industry

means of an annual summary. The Reporter is a mimeographed publication issued twice a month during the growing season in an edition of about 750 copies going principally to persons working on plant diseases but also to other botanists, agricultural workers, and institutions. It contains the current reports considered to be most important and most likely to be of immediate value to plant patholo-

gists. The annual summary constitutes a record of the plant-disease situation of the year and is made at the close of each season. It is usually published in separate parts on a crop basis as supplements to the Plant Disease Reporter. Annual tables of plant-disease losses are also compiled, and special summaries are prepared from time to time on request of individual investigators, offices, or departments. The survey has published a check list of the plant diseases of economic plants in the United States (Department Bulletin 1366–D), which serves as an excellent guide for the names and distribution of the various diseases.

The accompanying chart (fig. 174) shows graphically how this information service is conducted. The upper part of the chart shows the various agencies reporting to the plant-disease survey either directly or through the State collaborators, and the lower part shows the recipients of the information given in the Plant Disease Reporter and supplements, special summaries, correspondence, and printed articles and bulletins.

R. J. HASKELL.

POISONOUS-PLANT Field Stations Aid Livestock Protection

Early in the history of the investigation of losses of livestock by poisonous plants, it appeared that different classes of animals might not be affected to the same degree, and that, in some cases, a plant destructive to one class of animals might not affect others even though the animals were nearly related. It was found, too, that habits of feeding and environment might make important modifications in the effects of the toxic substances. Therefore it seemed necessary to make feeding experiments on all kinds of animals that were likely to suffer from these plants, and to make these experiments, so far as possible, under field conditions. For this reason, feeding experiments with more or less temporary outfits were undertaken in a number of places. It was soon found that, for efficient work, the facilities of a well-organized station were essential.

Old Homesteads Become Experiment Stations

The first station for this work was established at Hugo, Colo., this location being chosen because of the insistent complaints, by local stockmen, of losses from loco poisoning. There a former homesteader's house was obtained and fitted up as a laboratory and office, with living quarters for a part of the investigating force. The others were accommodated in tents. Pastures, obtained through the courtesy of the stockmen and of the Union Pacific Railroad Co., were fenced, and experimental livestock were furnished by a cooperative arrangement with the Colorado Agricultural College. This station was occupied for four summers, and the loco problem was practically solved there. The location was particularly good for loco work, because at that time losses of livestock from loco poisoning on the Colorado plains were heavy. While the experimental work was going on at Hugo, similar experiments, on a smaller scale, were being conducted in western Nebraska and in the mountains of Colorado.

On the abandonment of the Hugo station, the summer work was transferred to Mount Carbon, Colo., on the Gunnison National Forest.

This station (fig. 175), at an elevation of 9,000 feet in the Rocky Mountains, was established specifically for work on the larkspurs—a group of plants in regard to which, at that time, there was no definite

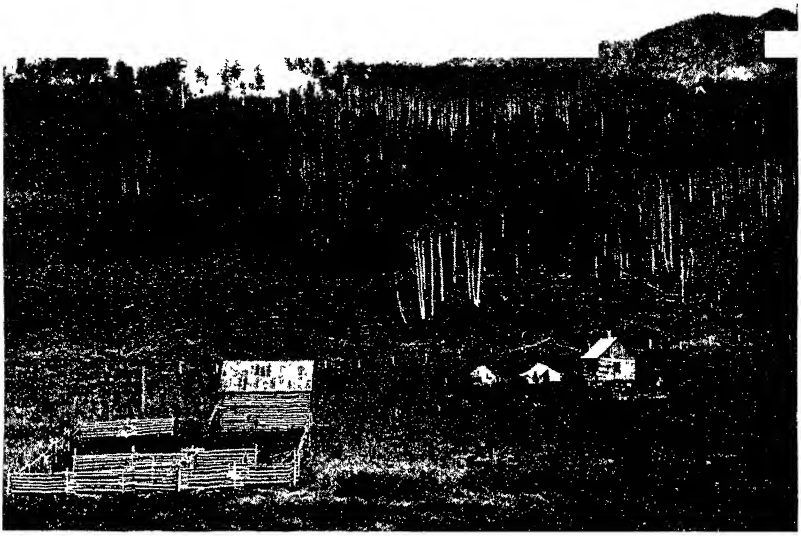

FIG. 175.—Where pioneer research on stock-poisoning plants was conducted. Research at this remote station, near Mount Carbon, Colo., resulted in definite knowledge of the conditions under which larkspur poisons horses and cattle

knowledge, although they were strongly suspected of causing heavy losses of cattle, sheep, and possibly horses. This station, established through the cooperation of the Forest Service, consisted of a ranger's

FIG. 176.—The poisonous-plant station at Greycliff, Mont., established to help sheepmen reduce mysterious losses among their flocks. Here Federal investigators determined the poisonous nature of the death camas, lupines, and low larkspur

station with the addition of special corrals and pastures. The Mount Carbon station was occupied for three summers. A number of plants were studied there, and the larkspur problem was settled so far as

cattle and horses were concerned. There still remained a question in regard to the effect of low larkspur on sheep, for, although no sheep were affected by the plant at Mount Carbon, there were definite reports of the loss of sheep, apparently from this plant, in Montana.

Therefore, after three summers at Mount Carbon, the work was transferred to Greycliff, in the Yellowstone Valley in Montana. Here again an old homestead was utilized. (Fig. 176.) With the cooperation of the Forest Service the house, barn, and corrals were repaired; pastures were fenced, and a telephone line was constructed.

At Greycliff the work was mainly concentrated on three groups of plants—the low larkspurs, the death camases, and the lupines. Work was done also on a number of other plants.

At both Mount Carbon and Greycliff the experimental animals were lent by stockmen, the Bureau of Animal Industry agreeing to pay damages for killed or injured animals. This cooperative agreement was very helpful, as the station had no responsibility for the winter care of the stock.

Salina Station is Well Equipped

On the completion of the work which could be carried on profitably at the Greycliff station the question of the next most desirable location was considered. Throughout the range country there were large losses from poisonous plants. It was decided to choose a place in the intermountain region where livestock interests are large. Accordingly, a new station was established in the Fishlake National Forest, in the Wasatch Mountains, about 16 miles from Salina, Utah.

FIG. 177. Pens used for experimental animals at the station in an aspen grove near Salina, Utah. Here research workers have found that most of the losses caused by poisonous plants of that region are preventable by various practical means

This location is on a range where all classes of livestock are grazed. It was found that cordial cooperation could be expected from the stockmen of the neighborhood, and there were important local problems, among them being "spewing sickness" and "oak poisoning."

At the selected place the Forest Service, by a continuing cooperative agreement, built a station of a more permanent character than those which had been occupied in preceding years. Three houses were built—a cookhouse, a bunk house containing rooms for some employees, others being accommodated in tents, and a fairly commodious laboratory with space for all necessary laboratory work. These buildings were equipped with running water and with acetylene gas for lighting and laboratory purposes. A barn was built and corrals and feeding pens were constructed. (Fig. 177.) Large pastures were fenced off from the range. The station is provided by the Forest

Service and is equipped and maintained by the Bureau of Animal Industry. Each year 25 or 30 head of cattle and about 50 sheep are provided by local stockmen under a cooperative agreement similar to that used at the Mount Carbon and Greycliff stations. These animals are kept in good pastures, and, so far as they are not injured by the experimental work, are under much better conditions than are animals on the range. Other animals like horses, swine, and chickens are obtained as needed.

It has been found that most of the stock-poisoning plants retain their toxic properties after drying. It has therefore been possible to study harmful plants brought in from other localities. Most of the experimental work with poisonous plants on the larger animals has been carried on at these field stations; however, certain experiments have been conducted at a number of other places.

The Salina experiment station is situated on the western slope of the Wasatch Range, on Gooseberry Creek, in an aspen grove at about the lower limit of the growth of that tree and of aconite and high larkspur. This station, which is very well equipped for summer work, has been occupied since 1915.

During the years in which these field stations have been occupied many bulletins have been published giving the results of the experimental work.

C. DWIGHT MARSH.

POPULATION Loss from Farms Ascribed to Variety of Reasons Twenty thousand men living in cities, towns, and villages on January 1, 1926, who had previously been farm operators living on farms were asked why they left the farms. Of these 20,000, 2,745 made reply, and the following is virtually the story of these men as told by themselves:

We represent every State in the Union. Some of us were farm tenants, some farm owners. In fact, one out of six was a farm tenant. None of us was a hired man at the time of leaving the farm. Two-thirds of us owners still own our farms. We have 9,000 children, and somewhat less than half of them are still in our homes. Over half of us left farming in the years 1924 and 1925. We were by no means new at farming, for many had operated farms as owners for a period of 10 to 14 years and even more for a period of from 30 to 39 years. A third of us had been farming from 100 to 174 acres. One-sixth of us had farms with from 175 to 249 acres, and 24 of us had farms of 1,000 acres or more. Most of us were born in the United States; only 1 in 10 was born in a foreign country.

Various reasons for giving up farming prevailed with us. In fact, our number may be classified into five main groups, each group having a different principal reason for moving to town.

More than a third of us found farming to be a poor business. This group could not make ends meet. High prices for the goods bought, low prices for the things sold, and high taxes finally convinced those in this group that matters could be no worse in town and might be better.

The next largest group contains fully a quarter of our number. Most of those in this group are elderly. They needed considerable hired help in the house and on the farm in order to carry on farming. This help could not always be obtained. Afflicted with growing physical disabilities and feeling the strain of advancing years, the members of this group decided the best solution of their problem was to go to town. This is our real retired farmer group, quite a different set of people in age and aims from Group No. 1.

One out of eight of us who were farm owners and 1 out of 18 of us who were tenant farmers came to the conclusion that the schooling for our children was too poor in the country and did not go far enough. This group left farming and went to town to work and live in order to give the children the benefit of town schools.

A small group, 1 out of 50, gave up the farm to a son or son-in-law. This number belongs also to the retired farmer group.

The last of the five significant groups is composed of moneyed farmers. Seventy-six of our farm owners and three of our farm tenants—that is, nearly 1 out of 40 of our total number—find themselves economically able to go to the city, lead an easier life, and enjoy for a while the things which they have always craved but never before felt able to have.

Such is the plain story told by these 2,745 townsmen who had once been farmers. The picture presented is a human one, convincingly showing that there are still social and economic problems to be solved on our farms.

C. J. Galpin.

Population Moving to Farms Includes Many Farm-Bred Men Ten thousand farmers—owners, tenants, and hired men—who were living on farms January 1, 1927, but who had recently moved to the farm from city, town, or village, were asked why they exchanged town life and work for farming. Eleven hundred and sixty-seven of these ten thousand new farmers gave their reasons. Apparently if they had elected a spokesman to present their case, he would have spoken much as follows:

We are a group of 776 farm owners, 344 farm tenants, and 47 hired men. Our homes are scattered through 45 States, the three not represented being Arizona, Delaware, and New Mexico. Ninety of us live in Pennsylvania, 86 in New York, 80 in Missouri, and 70 in Michigan. Considerably more than half our number left city, town, or village for farming in the years 1925 and 1926; 1 in 7 of us left in 1924.

It will doubtless occasion no surprise to learn that nearly all of us were either brought up on farms or had had some previous farm experience. In fact, only 155 of us were totally new to farming. Three hundred and eighty-nine had owned farms, 330 had been farm tenants before, and 153 had been hired men.

We have as a group a good many children. One-fifth of us have 1 child to the family, another fifth have 2 children to the family, while an eighth of us have 3 children to the family. As to age, our group falls about equally into four divisions—aged from 30 to 34; from 35 to 39; from 40 to 44; from 45 to 49.

The great majority of us like farm work, after all, better than town work, and we consider farming a good occupation, although a certain number of us view farm work and city work as about equally desirable; farm work being perhaps a little harder, but usually more healthful. The fact is that half of our number make a better living on the farm than we did in the town; especially is this true with the tenants. Some of us expect to make a better living on the farm, but have not yet had time enough to prove out on it.

It is a mystery to many why we left town and went back to farming in precisely those years when so many other farmers were leaving the farms for city, town, or village. The reasons were very clear in our own minds, for you will remember that most of us had had experience on farms before and were able, therefore, to compare farm life and city life. The main inducements which won us back to farming were the basic advantages of the farm for health and living conditions, especially for our children. We highly valued the closeness to nature and the spacious character of country life.

Some of us who are hired men found out to our sorrow that the cost of living in cities ate up all our wages; and that we could really do better on the farm and save more money. A considerable number of us owners and tenants feel the same way as the hired men about the opportunity in the country.

The fact is that, more or less, we all got tired of city life; and it is no small advantage to us that we can live on the farm an independent life.

This short story from our supposed spokesman, in the words of this group of farmers, as their replies came in to the department, indicates some disillusionment in the experience of these men with city living, and leads one to believe that a part of the large group of

farmers who left the farm for the city in the same years in which these farmers came back to the farms from the city will in turn pay for their experience with unfulfilled expectations and disappointment and later turn their backs upon city life.

C. J. GALPIN.

PORK Consumption in U. S. Is Nearly Half of the Meat Eaten Pork occupies an important place in the dietary of the American people. During the year 1926 the consumption of pork amounted to 46 per cent of the meat eaten. The estimated per capita consumption of each kind of meat and of lard was as follows: Pork, 65.7; beef, 63.4; veal, 8.2; lamb and mutton, 5.5; and lard, 13.5 pounds.

FIG 178 —Smoked-meat storage room in a modern packing house

The term "pork" denotes the flesh of swine used as food, but in commercial practice the carcass of the hog is divided into a great variety of standard cuts depending on the type of carcass and the market for which the products are intended. The average housewife, however, is probably familiar with only a few pork cuts such as hams, shoulders, bacon, and pork loins. Cured and smoked pork cuts (figs. 178 and 179), with a few exceptions, are preferred to the fresh cuts, and it is estimated that approximately 80 per cent of the pork cuts are sold as cured products. Hams, bacon, shoulders, and butts are usually sold as cured or smoked products, while pork loins and tenderloins are ordinarily sold in fresh condition.

Wide Variation in Composition of Pork Cuts

The composition of the different cuts of pork varies widely owing to great variations in the amount of fat deposited in different parts of the carcass. There is also a great variation in the fat content of the same commercial cut from different types of hogs. The hog is preeminently a fat-producing animal, and the proportion of fat to lean is much greater than in either cattle or sheep. The leaner cuts of pork, such as hams, shoulders, loins, and tenderloins are richest in protein or muscle-building material, while fatbacks, which are practically devoid of lean meat, are very poor in protein. Lean cuts of pork contain approximately the same amount of protein as moderately fat beef. The energy-producing value of the different

FIG. 179.—"Sweet-pickle" cellar used for the curing of pork products

cuts of pork varies directly with the fat content. Fatback is richest in fat and has the highest fuel value, whereas pork tenderloin is poorest in fat and has the lowest fuel value. In general, pork cuts have much higher fuel values than corresponding cuts of beef or lamb.

Digestibility of Pork

As regards the digestibility of pork, this term has two meanings: (1) Rate of digestion in the stomach, and (2) completeness of digestion in the entire alimentary tract. As a result of numerous experiments with human subjects Hawk, of Jefferson Medical College, Philadelphia, found that, on the average, the leaner cuts of pork were digested approximately as rapidly as other kinds of meat. Pork also appears to be digested very completely. Grindley, of the

University of Illinois, in experiments with human subjects, found that pork, as well as other kinds of meat, was thoroughly digested. Since pork is a comparatively fat meat, it is significant that the relative fatness of the meat had no appreciable effect on the completeness of digestion.

Proteins in different food products differ widely in the efficiency with which they are utilized by the human organism. Pork, as well as other meats, contains protein, which is not only digested very thoroughly, but which is also utilized very efficiently for the purposes of repair and growth in the living organisms. Lean pork is also an excellent source of the antineuritic vitamin.

RALPH HOAGLAND.

PORK Curing Needs Extreme Care to Give Best Result The most important ingredient to be put into the pork barrel is carefulness. One hundred pounds of meat can be cured with 3 pounds of salt or 12 pounds of salt and widely varying amounts of sugar and saltpeter, but unless carefulness is included, the resulting product will be neither economical nor palatable. The boys complain considerably nowadays about the fussy crankiness with which grandpa puts the meat in cure, but grandpa learned his lesson in the hard school of experience, and he knows that unless meat is put down with care, refined almost to the degree of crankiness, the result will be unsatisfactory.

The practice of carefulness should begin before one even sharpens a knife or starts a fire under the scalding kettle. Hogs vary considerably in the quantity and character of the meat which they produce. The animals slaughtered, therefore, should be selected to produce the weight and quality of meat desired. A trimmed ham will weigh about 7 per cent of the live weight of the hog; the bacon strip about 5 per cent. If one desires 10, 15, or 20 pound hams, the hogs slaughtered should be of corresponding weights. Where lard and sausage are the products desired, very large and very fat hogs meet the need.

Use for Meat Governs Method of Cutting

The selection of the cutting method is determined by local preference and the use to which the meat is to be put. If the farmer intends to sell his meat, he should by all means make the cuts that find greatest local favor. If he is killing a single hog in the winter and his family likes fresh pork, almost any of the parts can be chilled or frozen and held until consumed. If, however, he is handling five or six hogs and putting down a summer's supply of meat, it is most essential that a cutting method be used which will give the maximum amount of meat for (fig. 180) curing and a minimum quantity that needs to be used fresh. A method which does not prepare most of the carcasses for curing and canning often forces the family into a pleasant but expensive feast in an effort to consume the fresh pork before it spoils.

Where the preservation of the meat is the end desired it is always better to split a hog carcass through the center of the backbone rather than on each side, as is so frequently the custom. This "center split" eliminates that most appetizing backbone cut, but it presents the two loin muscles in such form that they can be boned out readily and economically for canning.

The general cutting method as described in Farmers' Bulletin 1186–F produces a three-rib shoulder, a full strip of bacon, a short or full-cut ham, the loin for canning, and 10 to 14 per cent of rendered lard from a 200-pound hog. This leaves only a small amount of headcheese or scrapple, 3 to 5 per cent of sausage trimmings, and from 3 to 5 per cent of the live weight of the pig in spareribs. Of these the ribs are the only part that needs prompt consumption.

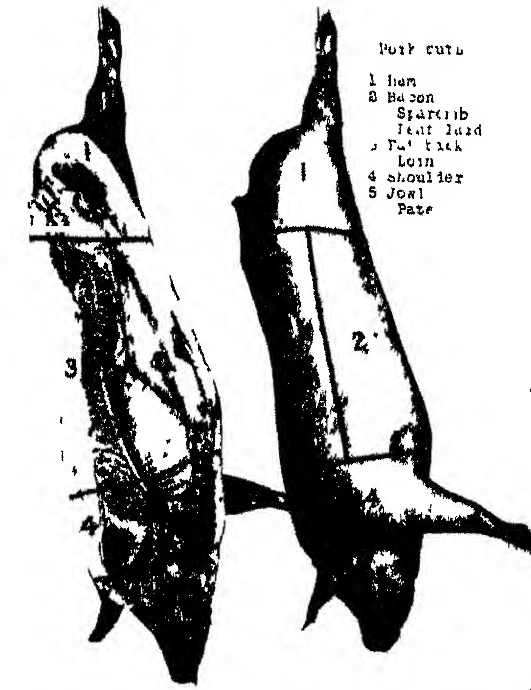

FIG. 180 – A cutting method which prepares most of a hog carcass for curing and canning

One more word about cutting. In trimming the pieces of meat for cure it is always best to trim them smoothly, cutting off the loose pieces and uneven edges. These short cuts become harsh and dry from over-curing if left on the hams and shoulders. They are much more palatable if trimmed off and put into the sausage meat. The smoothly trimmed cuts are also much neater and more attractive (Compare figs. 181 and 182.)

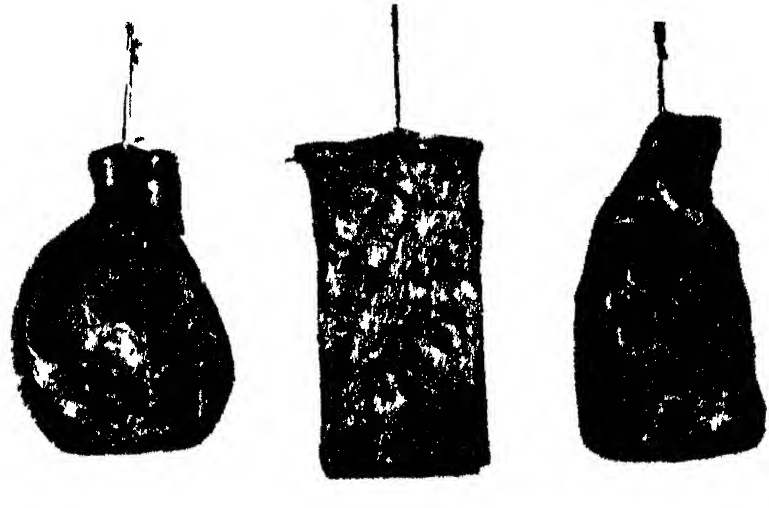

FIG. 181 – Ham, bacon, and shoulder neatly trimmed Compare with Figure 182 showing improper trimming

Control of Temperature Essential

In these days of disease-eradication campaigns, nitrogen-fixing cultures for alfalfa land, and manufactured buttermilk everyone is more or less familiar with bacteria. Bacteria play an active part in curing meat. Species that cause spoilage are present when the hog is killed, and it is most vital that their development be checked until the salt can take command and stop their growth. Other and desirable species of bacteria should be present in the curing mixture for the production of the desired color and, probably, flavor of the meat. It is important that these latter species be given a chance to develop normally and actively while the meat is in cure.

Temperature control is the instrument at hand to control the growth of the harmful bacteria and to aid that of the desirable species. From 34° to 36° F. is the ideal temperature for the center

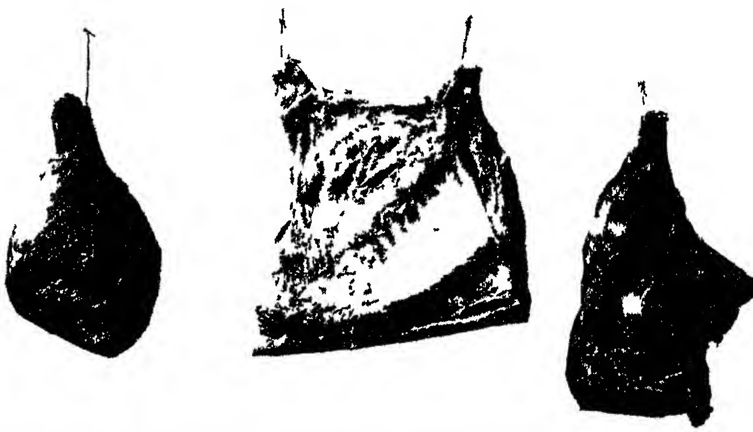

FIG 182—Poorly trimmed ham, bacon, and shoulder. Besides being less attractive than the products shown in Figure 181, poorly prepared meats usually bring lower prices

of a hog carcass 24 to 48 hours after slaughter. It is undesirable to freeze the carcass. The best temperature for curing meat is from 36° to 38°. Uniformity in soundness and palatability, one pork barrel with another, depends in no small degree on the care with which the temperature can be controlled.

There is no one best curing recipe or cutting method which will apply to all. The one best suited to each person's needs and taste is the one for him to use, yet whatever method is selected it is important that care be used in its application. Only as one individually can standardize his methods can he be sure that the products of his pork barrel will be uniformly palatable and economical.

K. F. WARNER.

POTASH Industry Is Progressing Despite Foreign Competition The American potash industry is making progress in the face of increasingly formidable European competition. Production is increasing through the enlargement of present plants and the establishment of new ones. These developments, though moderate, are conservative and well

considered, and offer the promise of a gradual but certain growth of the industry on the broad foundation of potash as a product of various raw materials and as a side product in a diversified manufacture.

Prior to the World War American agriculture depended on the German potash industry for all its potash. During the war it depended on that potash which could be obtained from various potash raw materials which governmental surveys had shown were available in this country. When German potash reappeared on the American market at the close of the war American potash industries which could not compete with it had to go out of existence, despite the fact that they had developed in the aggregate a production capacity of half of our normal requirements. As a consequence, American potash production fell to one-tenth of our normal importations.

It has now increased again to one-quarter of our annual consumption. This shows that, against the competition of the German-French potash monopoly with its backing of German industrial skill and French governmental assistance, the American industry, unsupported by tariffs, can increase its production at prices acceptable to the farmer.

The chief American producing company manufactures an excellent grade of muriate of potash from the saline brines of Searles Lake, Calif. This concern illustrates the type of potash industry which, in the opinion of many persons conversant with the American potash problem, is necessary to success under American conditions. It seems to be definitely established that, to produce potash from those American raw materials so far surveyed, at prices which the farmer can pay, other products of value must be obtained in the operation, so that the potash will bear only part of the costs involved in its extraction.

Accordingly, in the extraction of potash from Searles Lake brine, other products such as borax, boric acid, common salt, and sodium sulphate, are produced or can be produced. These offer a series of side-products of such purity and value that the potash—also in a high state of purity—escapes with such a small portion of the manufacturing costs charged against it, that it can meet the European product on terms of equality.

A company in Maryland produces a valuable form of potash from a waste material, the residue from alcohol manufacture. In this process, cane molasses is fermented for alcohol production, and the residues are burned to produce steam. The ash resulting—which is in fact plant ash—contains 35 per cent of actual potash (K_2O) and various other things which the sugar cane, in growing, found useful. The gases yield ammonia and some additional potash recovered as ammonium potassium sulphate. Two high-grade fertilizer ingredients are here recovered, as a by-product of alcohol manufacture, from a waste material usually considered worthless.

Potash manufacture as originally practiced in Germany was a simple mining operation. It is now a strictly chemical one. This principle applied to American conditions offers the possibility of utilizing a great variety of natural raw materials and trade wastes available in many parts of the United States, provided other products can be obtained concurrently. Agriculture demands cheap potash—potash freed from high manufacturing and transportation costs. Such potash is promised by the developments now taking place.

J. W. TURRENTINE.

POTATO Diseases of Virus Group Due to Cause Not Yet Known

Since the cause of the virus diseases of the potato has not been discovered, they are called simply virus diseases, the term virus including whatever causal agents may be found later. Although the cause of these diseases remains a mystery, considerable evidence on symptoms, types, means of transmission, and effect on yield and control has been obtained within the last decade.

The different types of virus diseases of potato may be considered under four groups: (1) Mosaic, (2) leaf roll, (3) spindle tuber, and (4) streak. Mosaic, so called from the mottled appearance of the foliage, is recognized on the leaves by light and dark green patches with somewhat vaguely defined outlines. Additional symptoms include wrinkling, ruffling, and dwarfing of the foliage. Mosaic types, distinguished by differences in mottling, dwarfing, and ruffling, have been described under the following terms: Mild, leaf rolling, crinkle, rugose, aucuba, and intervenail.

FIG. 183.—Leaf roll of the potato; Green Mountain variety

Leaf roll (fig. 183) is distinguished by the upward roll of the leaves, so that the midrib remains at the middle of the trough thus formed. Plants infected with leaf roll while very young, or plants from leaf-roll tubers, manifest roll at first on the lower leaves, followed by rolling of the upper leaves later in the season. Other symptoms of leaf roll include dwarfing, rigidity, chlorosis; yellow, red, or purple discoloration of the leaves; short stolons; and reduction in number and size of tubers.

Witches'-broom Causes Bushy Habit

Witches'-broom is recognized by the bushy habit of the plants, brought about by numerous slender shoots. Many very small tubers, 50 or more to the hill, form from such plants. Chlorosis, more or less rolling of the leaves, and internal necrosis in witches'-broom plants suggest a relationship of this disease to leaf roll.

The chief characteristic symptoms of spindle tuber (fig. 184) are elongate, pointed, and cylindrical tubers and stiffly erect, somewhat staring, tops. Among potato growers this disease is frequently designated as "running out" or "running long." It may well be regarded as a typical example of the so-called running out of potatoes. Spindle

FIG 184.—Potatoes of the Green Mountain variety A, Affected with spindle tuber B healthy

tuber is the only potato malady which can be recognized from the shape of the tubers provided infection occurs early in the season

Streak (fig. 185), so called from the streaking, spotting, burning, brittleness, leaf dropping, and premature death of infected foliage,

FIG 185 A, Healthy potato plant B plant affected with streak late infection produced by aphid inoculation in cages C plant grown from streak diseased tuber

renders many varieties completely devoid of tuber production after the first year's infection.

Virus diseases of potato have been reported from the important potato-growing sections of the country. Since fair yields may result in the presence of the milder forms of mosaic in northern potato localities, fields with 100 per cent mosaic may be found. On the other hand, practically disease-free stock occurs in regions where careful growers have reduced these diseases through introduction of disease-free potatoes or through elimination of diseased plants by roguing.

Means of Dissemination

Experiments have shown that insects spread virus diseases from diseased to healthy plants. Three different genera of aphids or plant lice—*Macrosiphum solanifolii*, *Myzus persicae*, and *Aphis abbreviata*—have proved to be active agents of spread for one or more of these maladies in this country. In Europe other insects—jassids, capsid bugs, flea beetles, and leather jackets—have been reported to be transmitting agents. These diseases have also been transmitted by grafting, rubbing of foliage with diseased juice, and in case of spindle tuber by means of knife and seed-piece rubbing.

Since affected plants manifest different degrees of dwarfing and early death due to inhibition of the normal growth processes, their productivity naturally is considerably reduced. Reductions in yield vary in different sections, depending on the seasonal, soil, and climatic conditions. Under favorable growing conditions the following reductions in yield have been observed in the Green Mountain variety: 20 per cent with mild mosaic, 30 per cent with spindle tuber, 70 per cent with leaf roll, and a total loss with streak after the first generation. Under unfavorable growing conditions about 15 per cent greater reductions in yield than indicated here have resulted. In addition to reduced yields, the size and shape, as in spindle tuber, render tubers undesirable for first-grade marketable table stock and of course wholly inferior for seed purposes.

Furthermore, experience with virus diseases of potato has disclosed that these maladies are at least one of the primary factors in the so-called "running out" of this crop. This is particularly the case with the severe forms of mosaic, spindle tuber, and streak, or in combined infection with these maladies.

Experiments in Control

The experiments proving that insects spread virus diseases of potato, and indicating that diseased potato tops are one of the primary sources for infection of healthy potatoes, suggest elimination of diseased plants from isolated fields for reducing the percentage of these diseases. In some of the northern seed-potato growing sections rigid roguing of isolated fields or seed plots has resulted in the production of high-grade seed stock. In fact, most of the certified seed potatoes in some sections have been developed in this manner. Roguing diseased plants can be accomplished most effectively in tuber-unit isolated seed plots. The diseased plants in such plots will appear in groups, facilitating inspection, making roguing possible sooner than in mixed hill planting, and reducing the chances for infection of healthy plants.

Potatoes on seed plots should be rotated with other crops so that volunteer diseased plants will not become a source of infection to the new crop. Spraying or dusting the seed plots for control of transmitting insects should be practiced throughout the growing season.

Tuber indexing for advanced seed-tuber testing has been helpful in the detection of good seed stock for seed plots. It is very apparent that practically disease-free potatoes should be used for propagation on the seed plots.

Until potatoes immune from these diseases have been developed, it is highly essential that the leading commercial varieties be maintained as nearly free from disease as possible where the most economical production of this crop is desired.

E. S. Schultz.

POTATO Diseases on Irrigated Land Tax Cultivator's Skill

Aridity is one of the outstanding conditions in the West under which irrigation is practiced. As a result of the low humidity, which makes leaf infections difficult, the fungous and bacterial diseases of the potato are nearly all confined to or originate in the underground portions of the plant.

The two diseases of most importance are caused by *Rhizoctonia solani* and by Fusarium species, frequently *F. oxysporum*. These fungi live in the soil and need not have been associated with the potato prior to planting in order to infect it. The two organisms have their temperature ranges within which they act and do their characteristic damage to the potato plant. The Rhizoctonia attains its best development in cool weather and is found mostly at high altitudes or in the early or late season of potato growth. When sufficiently warm weather occurs the Rhizoctonia becomes inactive and the Fusarium proceeds to increasing destruction. The optimum temperature ranges within which these two types of fungi work are separate, so that a plant suffering with one disease is rarely if ever afflicted with the other. When the temperature changes for a period, the kind of disease may change.

Any disease attacking the potato roots or stems is a serious one. The roots and stems are the most vulnerable points of the plant. The roots have to procure and pass on to the vine above an adequate and relatively constant supply of water. The underground stem has to transmit the water and in addition serve in the transportation of sugar from the foliage to the stolons and tubers. An injury to the stem retards the passage of water from below to the vine, resulting in a weakened plant; it also means that the plant's manufactured foods, naturally disposed of and stored in the tubers, remain in the foliage, causing there a congestion and sickness which is revealed in changes in the leaf color from green to yellow or purple and which makes the leaves brittle and coarse to the touch. In extreme cases the plant finds some relief in the development of small green tubers at the ground surface or in the leaf axils. An injury to the true roots resulting in a delayed or suspended water supply does not affect the passage of food materials downward, but retards or even stops the manufacture of food. This creative action proceeds in the leaves in the presence of a liberal supply of water. Too much injury wilts the plant and may cause its death. The root system of the

potato plant is a small one, considering the size of vine and the number of tubers produced. The total water requirement of the potato is lower than for most crop plants; the potato ranks next to the sugar beet in low water consumption.

The Potato a Delicate Plant

In brief, the potato is a delicate plant. Its small root system is taxed to capacity to maintain a very active and capable vine in the production of abundant food materials, the large excess of which is stored in tubers. The plant is continually exposed to infectious diseases, for throughout its growing period, from planting to harvest, parasites are in wait and seize every opportunity for infection and development.

The potato has some resistance against disease. It is the business of the farmer to assist the plant to maintain this inherent resistance,

FIG. 186.—Diseased potato plant under irrigation. It is light in color, smaller than its neighbors; the leaves are rolled, and the tubers rough. The Rhizoctonia or Fusarium fungus may produce this type of plant

and this he can do to some degree. As has been explained, the fungous diseases of the potato under irrigation are mostly underground. It is obvious that the potato needs water, and needs it liberally. But in this very act of irrigation another condition may develop which is harmful; that is, the exclusion of air. The potato needs air nearly as much as it needs water. The roots must have oxygen, for they and the tubers respire freely. An injured or diseased root or stem respires more rapidly than a healthy one. For recovery oxygen is necessary, and for the maintenance of the normal disease-resisting power the affected parts must have access to air. As plant activity increases and more roots are formed and tubers grow, aeration becomes more important. Irrigation usually becomes more frequent as the plants get larger, and aeration naturally becomes restricted.

Western irrigated soils are usually deficient in humus, owing to the destructive action of alkali salts. Before preparing potato ground, manure containing straw should be spread in suitable quantity.

Where alfalfa ground is used, as is commonly the case, manure can be spread in the fall and the alfalfa crowned to a depth of about 4 inches. In the spring this ground is plowed again to a depth of 9 inches or more and worked down into a good seed bed. Some prefer to turn under a stand of alfalfa late in the spring, a practice that adds much humus to the soil. A soil which packs easily when water is added to it needs more humus than lighter soils. Mountain soils, notably land on which aspens have long grown, are filled with humus and offer most favorable conditions for potato growth.

After the potatoes have been planted, deep and thorough cultivation is necessary. This conserves moisture, lets the roots expand freely, and permits good aeration. After irrigation begins and the plant reaches a height of 10 or 12 inches there is a tendency to suspend further cultivation because of injury to the roots. That should better be determined by the nature of the soil. It is possible to injure potato roots by cultivation continued too late in the season, but in soils which pack tightly, and which are deficient in humus, it is a risk well worth taking.

Drainage also enters here as a factor. Poorly drained soils are equivalent in a sense to tightly packed soils. Water should not stand on potatoes, as that, too, is one of the best disease-promoting conditions.

Irrigator's Skill Required

After the stage has been reached where cultivation either deep or shallow has become impossible, the skill of the irrigator becomes more evident. There is an art in potato irrigation which is not matched in any other cultural treatment. In application the water must be adjusted to the slope of the ground and the length of the rows. If the rows are too long or the ground too flat, a sufficient head of water must be maintained to force it through without too much delay. A small stream is absorbed at the head of the row. On sloping or hilly ground a smaller stream must be used for a longer time so that washing is prevented and the water becomes absorbed evenly down the length of row. The type of soil and its absorptive power is likewise a factor. Soils must not become water-logged, or the potatoes are injured. They must not be left too long between applications, or capillarity is destroyed, they become difficult to wet, and the plants suffer from drought. They must drain well or air does not reach the roots and tubers, and infections occur.

Infections will occur, however, even under the best of conditions, for some plants will be weaker and less resistant than others. Oftentimes the infection brings about a condition which might be mistaken for poor irrigation. Irregular irrigation develops rough tubers. With the Rhizoctonia disease, plants which are well infected commonly develop rough and knotty tubers. The root hairs and fine roots are killed by the fungus, which has the effect of creating a temporary drought for the plant, and it suffers for water until new roots can begin to function. The temporary stoppage in water supply stops the tuber growth. When growth is resumed, the tubers grow at the eyes and develop a rough shape.

Good soil is a first requirement of irrigated potatoes. Where the soil is not naturally favorable it is essential to improve it by the addition of humus and much working. As soon as the potatoes

are planted, cultivation is a most important process for the health of the crop. Cultivation and irrigation go hand in hand for a while, but irrigation continues nearly to the end of the season. For intelligent irrigation there is no substitute, and there is no guide except good judgment. The diseases of the potato are always ready to develop, and diseases are aided best by poor soil, poor cultivation, no aeration, and poor irrigation. One of the best disease preventives is good cultural practice combined with sound judgment. The healthy potato is the growing potato, and to keep it in health it must be treated well and kept at work.

H. G. MacMillan.

POULTRY Demonstration Farms a Big Help in Poultry Improvement One of the substantial developments in poultry extension work has been the poultry demonstration farm. This is not an experimental poultry farm but a representative farm the owner of which agrees to follow approved practices of poultry production as recommended by the agricultural extension service. By adopting the improved methods of breeding, feeding, housing, and management, the owner not only benefits himself but demonstrates these methods to others in his community. The extension poultry specialists assisted by the county agricultural agents in 29 different States have interested over 3,000 poultrymen in carrying on demonstrations of this type.

The demonstration farm is started by an agreement between the owner and the extension service. The latter agrees to furnish record forms; to supply a monthly summary of all flocks; timely hints and bulletins and, in some cases, personal assistance.

The first essential of the flock owner is to keep a record of the income and outgo of the poultry operations. Experience shows that a farm without a record is like a clock without hands; you may keep it running but you never know the time. There are two types of record forms in use, one called the calendar form, which is a monthly postal card report showing egg production and mortality, the other a more complete record sheet showing egg production, sales, and costs.

Many interesting stories are told of how the keeping of records brought about improved practices. One woman wrote that her husband hated her chickens, until she induced him to keep the records. Then, realizing their profitableness, he wanted to claim an interest in the stock, and insisted on building an up-to-date poultry house.

Another told how proper housing made a difference in the income and how the profits in culling out the low producers were shown by the reduction of the feed bill with very little change in the egg income.

Conducting a demonstration poultry farm is valuable to the owner, but the greatest benefit has come from the influence of such a demonstration to the community in which it is located. When a flock owner adopts a new practice he is sometimes skeptical as to results. When the practice proves satisfactory he becomes enthusiastic and soon his neighbors hear of his results. They in turn take up the practice and the entire community is benefited.

The demonstration farm is a logical place to hold a community meeting on poultry. The flock owner is usually glad to help call the friends and neighbors together so that the extension workers can meet them as a group. Not only does this enable the workers to

reach a large number of people but in the general discussion many local angles of the question are brought forward and solved

In a certain county in Missouri, there is an excellent example of the far-reaching effect of the poultry demonstration farm. (Fig 187) This farm built a poultry house with plans furnished by the university poultry department. A small change from the plans was made in the roof, one that in no way affected the efficiency of the

FIG. 187 —A meeting on pullet development at a demonstration farm in Missouri

house. To-day more than 50 poultry houses in that county are constructed like that on the demonstration farm, rather than the published plan

H. L. SHRADER

POULTRY-DISEASE Toll Indicates Necessity of Control Measures Domestic fowls, though of less value individually than other farm animals, deserve serious consideration from a disease-control standpoint. They are the commercial units on which the extensive poultry industry is based. The number of domestic fowls in the United States is estimated at about 400,000,000 or considerably more than twice the number of all other farm animals combined.

In recent years, moreover, the value of individual birds, especially when well bred and from high-producing families, has been sufficient to justify the cost of veterinary treatment. In the light of these comments it is clear that the time has passed for accepting the inroads of disease among fowls without a serious endeavor to determine the nature of the infections and means for preventing their recurrence.

The outbreak, in 1924, of European fowl pest in the United States illustrated the intimate relation between our poultry industry, other business enterprises, and public welfare. Though the number of affected flocks was extremely small in proportion to the total number in the country, the effect of the outbreak was far-reaching. Owing to risk of birds' developing the disease in transit in the affected regions,

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market prices underwent a sharp decline. Normal marketing suffered interruption because of the need to disinfect coops, cars, and other equipment. Some poultry-killing establishments closed temporarily, throwing their employees out of work. In brief, the presence of this infectious disease among a very small proportion of the poultry flocks in only nine States had a disturbing influence far greater than its own seeming importance.

Effective Control Organization Needed

To combat poultry diseases effectively on a large scale requires well-organized plans. There is need also for a competent personnel, adequate funds, equipment for cleaning and disinfecting, and legal authority. It is desirable also to have a unified organization of State agencies responsible for supervising and interpreting standardized tests for the presence of some diseases. Such plans involve no new principles but are merely the application, to poultry, of methods found to be successful in human medicine and in treating the larger domestic animals.

One of the diseases which deserves the serious attention of poultry raisers is tuberculosis. The type of tuberculous infection found in poultry is transmissible also to swine. Fowl tuberculosis is thus a menace to the country's extensive swine industry, and the danger is especially great when poultry and swine are raised on the same farm. When infection is extensive in a flock the method of eradication commonly advised is to dispose of the entire flock, clean and disinfect the premises, and restock with birds known to be healthy. On the other hand, when infection is less extensive the tuberculin testing of fowls is advisable and is already being used to some extent. It has no adverse effects on normal, healthy birds.

Another serious problem that the poultry industry faces is the control of bacillary white diarrhea of chicks and the related disease, pullorum infection of hens. The effective control of such infection is complicated by the extent of the baby-chick business, interstate shipments of breeding stock, and other distribution of chicks and fowls which tend to spread infection. These conditions explain the need for a unified organization of State agencies previously mentioned.

Parasites Take Needlessly Large Toll

Various poultry parasites, although well known to flock owners, still take a heavy toll. The losses result commonly from a faulty understanding of the best means of control or from the failure to realize the extent of damage caused. The assumption that a large mortality of chicks is inevitable is not in accord with the attitude of research workers whose experience proves the fallacy of such reasoning. Their task and also their achievements in the past have been to ferret out the exact cause and find the effective means of prevention.

For instance, the parasitic worm which causes the condition known as gapes is one of many poultry pests which cause needless losses. Turkeys are important sources of gapeworm infection in young chicks, though the turkeys themselves seldom show evidence of the presence of the parasite. But when chicks are reared with turkeys or on land over which turkeys range, there is difficulty in avoiding losses of young chicks, caused by gapeworms.

In the selection and use of disinfectants for dealing with poultry diseases and parasites, well-established scientific facts have much practical commercial value. The action of most disinfectants is highly selective. As a consequence the proper choice of a disinfectant for a definite purpose has much to do both with its effectiveness and with the cost of disinfecting operations.

Much practical information on diseases of poultry has been summarized in publications of the department which are distributed without cost to the public. During the last five years approximately a million copies of one of the bulletins, Diseases of Poultry, have been distributed to interested persons. The issuance of such information is not only a wise investment for the benefit of the industry, but is also a cordial message expressing the interest of the National Government in every poultry raiser's flock.

J. R. MOHLER.

POULTRY Feeding Influenced by Research Results Poultry feeding has been very materially influenced by recently acquired knowledge of the effects of vitamins, minerals, and proteins on the growth of chickens and on egg production. Most of the previous information on poultry nutrition was obtained from common feeding practices and has been greatly clarified and improved by more fundamental research involving laboratory tests with chickens and rats. For instance, growing chickens kept confined would grow fairly well for a while but would soon become weak on their legs while still making good gains. When these chickens were put out of doors, they improved rapidly and it was thought that proper growth could not be obtained except from chickens kept on the ground. Now we know that this leg weakness was caused by lack of certain vitamins and when they are supplied good growth can be obtained in chicks kept indoors.

Both egg production and growth may be greatly influenced by the character of the ration used. The use of animal protein, such as meat scrap, fish meal, or milk, in a ration consisting only of staple grains, used for many farm flocks, will increase egg production about one-half and at the same time materially lessen the cost of producing the eggs. Proper feeding materially affects returns, since feed cost is the largest single item in the production of eggs and poultry. The common grains, such as corn, wheat, oats, and barley are all excellent poultry feeds; they supply particularly carbohydrates and fats but are somewhat deficient in certain vitamins and minerals and in the quality and quantity of their protein. Chemical analysis alone will not determine the desirability of a ration. The character of the protein, the presence of certain vitamins, and the palatability of the feeds must also be considered. The high feeding value of yellow corn, when properly supplemented, has been clearly demonstrated, so that that grain is now being used to make up a larger percentage of many poultry rations.

Essential Requirements

The essential requirements for a good poultry ration are as follows: Proteins not only of sufficient quantity but also of the right kind, carbohydrates and fats in sufficient quantity to meet the energy

needs, sufficient supplies of certain vitamins, and an adequate supply of minerals. The relative prices of feeds must also be considered in making up a suitable ration. A well-balanced, egg-laying ration is a combination of feeds which furnish just the necessary amount of nutrient and accessory factors to produce the highest and most economical egg yields. (Figs. 188 and 189.)

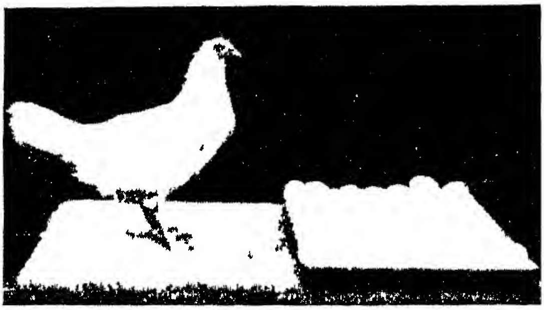

FIG. 188.—This hen, fed only whole and ground grains, laid only 85 eggs and then went into an early molt

The protein is the most important and most expensive part of the ration and materially affects both egg production and growth. Animal protein is superior to vegetable protein in poultry feeding. Vegetable protein may be used economically in some sections where animal protein is high in price and vegetable protein is cheap, if supplemented with additional minerals or with a small percentage of animal protein. Best results are obtained from mash, containing from 15 to 20 per cent of feeds which are high in animal protein. Certain amino acids are essential in the proteins, since some of the various amino acids can not replace one another and are not synthesized by the fowl. Very little research work in poultry nutrition has yet been completed with either the amino acids derived from the proteins or with the fat in the rations. Meat scraps and corn, two of our most important feeds, are highly digestible, but information on the digestibility of many of our poultry feeds is very limited.

Vitamins

Much more work has been accomplished in the study of vitamins, especially with vitamins A and D, which are the vitamins most likely to be deficient in poultry rations. Lack of vitamin D in the ration of growing chicks, which are confined indoors, causes leg weakness or rickets. Sunshine that passes through ordinary window glass loses its ultra-violet rays which assist in the use of this vitamin. Certain glass substitutes which do not cut off these ultra-violet rays are being used in the fronts of many brooder houses. Vitamin D controls the utilization of minerals in the ration. It is abundant in cod-liver oil and egg yolk and may be supplied by using 2 per cent

FIG. 189.—This hen, fed ordinary grains supplemented with meat scrap, laid 150 eggs in one year

of a high grade of that oil in the mash for young chickens. Chickens which get enough direct sunlight do not need cod-liver oil in their feed. Vitamin A is essential but is sufficiently supplied in rations containing green feed and at least 40 per cent yellow corn. Cod-liver oil is rich in this vitamin, but feed containing the oil should be fed promptly, as vitamin A is unstable and is readily lost.

Vitamin B is important but is usually well supplied in the ordinary poultry rations made up of cereals and their by-products. This vitamin is abundant in yeast and in green feed. Vitamin C is not considered essential in a poultry ration. Less is known about vitamin E, the lack of which causes sterility. This vitamin is found in small quantities in green feeds, in germinated oats, in yellow corn, and is most abundant in wheat germ. Yellow corn, green feed, direct sunlight, and cod-liver oil are especially useful in supplying vitamins in poultry rations.

Minerals

Minerals are very essential in poultry nutrition but are less likely to be deficient in the ordinary rations than are the vitamins. The essential minerals which are likely to be deficient may be furnished cheaply by including limestone, oyster shell, ground bone, and iodized salt in the rations. A supply of oyster shell or similar product furnishing calcium should be kept before hens all the time, and from 2 to 5 per cent of bone meal should be fed in the mash for both hens and chicks. The kind and amount of minerals to be supplied depend largely on the nature of the ration. One per cent of salt should be included in all mashes.

Some of the most recent developments in poultry feeding are the general use of milk and the use of an all-mash ration. Milk has always been recognized as a desirable poultry feed, but its great value in the diet of growing chicks to help prevent coccidiosis has been demonstrated only recently. The all-mash method of feeding consists in supplying the entire ration in a ground form which is kept constantly before the poultry. One of the advantages of this method is that every fowl is sure to get a balanced ration instead of varying proportions of scratch feed and mash. This method is now used generally in research work and is also being used successfully in commercial poultry feeding.

ALFRED R. LEE.

POULTRY Inspection of Live Fowls in New York Succeeds The annual requirement of New York City for live poultry is about 12,000 cars weighing 17,000 to 18,000 pounds each, or a total of something over 200,000,000 pounds. About 85 per cent of this total is consumed by the Jewish population which, because it requires its poultry to be koshered or killed in accordance with the rites of the Jewish religion, must depend upon live poultry for its needs. As approximately 30 per cent of New York's population is Jewish, that city is by far the largest live-poultry market in the United States and spends over $60,000,000 annually to supply the demand for this product.

The health department of the city of New York has promulgated regulations intended to assure its citizens a supply of healthy, normal live poultry. These regulations provide that all poultry unloaded for sale in New York City must be inspected to make sure that it is

healthy and that it is not in an overcropped or overfed condition. Since November 15, 1926, the task of inspecting this live poultry to supply New York's needs has, by approval of the department of health, been carried on under the supervision of the Bureau of Agricultural Economics

A corps of 15 inspectors, licensed by the United States Department of Agriculture and working under the direction of a supervising inspector representing the department, is assigned to the accomplishment of this task, which they perform under regulations of the Secretary of Agriculture. These regulations were promulgated in accordance with the requirements of the city health department. These men are stationed at the five railroad terminals where the cars of live poultry arriving by freight are received, and at the West Washington Market where the great bulk of express poultry is handled. Before a car can be unloaded it must be inspected and approved by one of these men. (Fig. 190.) The whole car is examined for diseased birds and any which are found are destroyed and denatured on the spot. In the case of occasional cars which show a seriously diseased condition, the city department of health is notified and the poultry may be unloaded only under the direcion of a competent veterinarian (several of whom are attached to the inspection force), who causes all birds which are unfit for food to be culled out and destroyed.

Inspection for Overcropping

The poultry is also inspected to determine whether it is overcropped. To determine this the inspector selects at random and in

U. S. DEPARTMENT OF AGRICULTURE

BUREAU OF AGRICULTURAL ECONOMICS

W YORK LIVE POULTRY COMMISSION MERCHANTS ASSOCIATION
GREATER NEW YORK LIVE POULTRY CHAMBER OF COMMERCE

LIVE POULTRY INSPECTION CERTIFICATE

Fee - - $
Expenses - $
Total - $ 5.00

No. 12442 I P

Date 10-13-27

This certificate is receivable in all Courts of the United States as prima facie evidence of the truth of the statements therein contained

Hour inspection was completed and applicant notified 9.26 AM Person notified P. COHEN #49

ADDRESS WEST WASHINGTON MARKET || ADDRESS LEXINGTON, KY.

CAR NO #1152 CAR NAME GUTHRIE WHERE INSPECTED NYC R.R. CARMAN B. FRANCIS

*ORIGINAL POINT OF SHIPMENT LEXINGTON, KY. *KIND OF FEED LAST FED DECKO,-CC

CONTENTS OF CAR BY LAYERS				
FOWL	COL 92	STAGS		*DAYS IN TRANSIT 3 — *DATE OF ARRIVAL 10-11-27
	LEG 15	SLIPS		NO OF FOWL EXAMINED 142 — NO OF BROILERS EXAMINED — METHOD OF TAKING SAMPLES ZZ
CHICKS	COL 16	COX	2	NO OF CROPS 2 OZ OR LESS 90 — 2 TO 4 OZ 44 — 4 TO 6 OZ 8 — 6 TO 8 OZ — OVER 8 OZ
	LEG	DUCKS	2	NO OF CROPS 1 OZ OR LESS — 1 TO 2 OZ — 2 TO 3 OZ — 3 TO 4 OZ — OVER 4 OZ
BROILERS	COL	GEESE	1	AVERAGE WEIGHT OF CROPS 1.84 — SANITARY CONDITION OF CAR GOOD — CONDITION OF HEALTH OF BIRDS GOOD
	LEG	TURKEYS		UNLOADING OF CAR APPROVED YES — REASON
				REMARKS * LOST ENROUTE 25 HEAD

I certify that in accordance with the regulations of the Secretary of Agriculture and the Instructions of the Chief of the Bureau of Agricultural Economics governing the inspection of live poultry pursuant to the Act making appropriations for the United States Department of Agriculture I inspected at the time and on the date stated above the live poultry described above and that the condition of said poultry at said time and on said date was as stated above

* As Stated by Applicant or Carman

INSPECTOR E.E. WELLER D.V.S.

PLEASE REFER TO THIS CERTIFICATE BY NUMBER

COPY

FIG 190—Live-poultry inspection certificate issued by the United States Department of Agriculture

different parts of the car at least 100 birds, and often 200 or more. He feels of the crop of each bird so selected and estimates the weight of feed which it contains. This he is able to do accurately because of special training he has been given in this work. If the average weight of the crops is over 2 ounces the car is not approved and can

not be unloaded until the following day, and not then until it has been again inspected and approved. The purpose of this inspection is to prevent feeding the poultry with excessive amounts of feed for which the consumer must ultimately pay poultry prices. The inspector also checks against the use of improper or unnatural feeds, such as grit, sand, pepper, etc., which may be given the birds for the primary purpose of increasing their weight.

This work is carried on by the Bureau of Agricultural Economics in cooperation with two trade organizations—the New York Live Poultry Commission Merchants' Association and the Greater New York Live Poultry Chamber of Commerce. The bureau is responsible for the conduct of the actual inspection work, and the inspectors are directly responsible to and their work is carefully directed by the supervising inspector who is its New York representative. Fees for the inspection are paid to a designated fiscal agent and the funds so accumulated are used to meet the salaries and other expenses of the service. These funds are paid out by checks, the amounts of which are approved by the supervising inspector and which are signed by designated representatives of the two cooperating trade organizations mentioned above. All expenses borne directly by the bureau in connection with this work are repaid into the Federal Treasury from these funds

Work Very Successful

Inspection of live poultry received for sale in New York City under the plan of operation outlined is an undoubted success. Direct supervision of the work by the Bureau of Agricultural Economics insures its thoroughness and carefulness and its fair and impartial conduct. Confidence in its operation has been established and it has proved an important factor in stabilizing and improving this business. At the same time, the cost to the bureau is comparatively small and, because of repayment of these costs into the Federal Treasury, the work is costing the Government nothing.

ROB R. SLOCUM.

POULTRY Parasites Cut Output and Raise Feeding Cost The control of lice and mites of poultry is a subject of the greatest interest. This is attested by the tremendous demand for information on the subject. In fact the yearly demand for Farmers' Bulletin 801-F, on lice and mites, has been as great as that for any other publication issued by the Department of Agriculture; 16 editions totaling nearly 1,000,000 copies have been printed.

This interest has been deeper than the mere calling for and reading of bulletins. The recommendations of the Bureau of Entomology have been put into effect by thousands of poultry raisers throughout the land. Probably the commercial poultrymen and fanciers have been most prompt to adopt these recommendations. In some of the most intensively developed poultry-raising sections it is not an easy matter to find a general infestation of lice, and mites are a rarity. Unfortunately the warfare has not been waged so aggressively by the owners of farm and town flocks, and these insidious parasites continue to exact their toll in egg production, lowered vitality, and retarded growth of fowls.

The loss caused by the several external parasites to which our feathered friends of the farm lot fall heir has never been figured; in fact, these losses are difficult to determine with exactness. They are generally recognized as serious and the evidence at hand shows that they must total millions of dollars each year, thus constituting one of the big money leaks in the poultry industry.

Importance of Curtailing the Loss

An effort has been made to draw the attention of poultry owners, especially the farmers, to the importance of curtailing this loss as a means of making the farm flock more profitable. It costs as much and usually more to feed a flock of louse-infested hens as it does to feed a clean flock, and the egg production is not infrequently cut 15 per cent by lice even in the absence of other parasites. This loss is usually not recognized since the general health of grown fowls is ordinarily not noticeably affected. In the spring, however, when the hatching season is on, the presence of the pest is often brought forcibly to the attention of the poultry owner by poor hatches, weak chicks, and frequently a considerable death loss among the chicks, especially from the attack of head lice.

FIG 191 —The simplicity and effectiveness against lice of dipping chickens in sodium fluoride solution make a strong appeal to boys as well as to experienced poultrymen

All of this is avoidable, and the simplicity and certainty of the treatment advised makes a strong appeal when it has once been tried. Commercial sodium fluoride, the insecticide recommended, has become the standard louse remedy of the country, and even in other lands its use is becoming popular.

The fact that sodium fluoride can be used in the form of a dust or a dip and that it will completely destroy all species of poultry lice and their eggs with a single treatment has fixed its position at the head of the list of louse destroyers.

The dipping of fowls in sodium-fluoride solution is becoming more popular each season as poultry owners learn its advantages over the dusting or "pinch" methods. (Figs. 191 and 192.) Com-

mercial raisers naturally were first to adopt this practice, as they recognized that it saves much time, is practically foolproof as regards efficiency, is economical of material, and does no harm to the fowls either by irritating the skin, soiling the feathers, or causing colds. Furthermore, the irritating effect of the dust on the operator and the fowls is obviated. All that is necessary to give full satisfaction is to choose a warm, sunny day for the work and treat every fowl.

Louse Remedy Not Effective for Other Parasites

Unfortunately the common chicken mite, the feather mite, the blue bug or fowl tick, the sticktight flea, and, as a matter of fact, all other external parasites of fowls require other methods of control than the one just outlined for lice, as sodium fluoride will not destroy them. Again, with these various pests, it has been the desire of the department to develop effective and inexpensive methods of repression. A measure of success has attended these efforts. The construction of simple demountable roosts and nests and the application of some of the heavy coal-tar distillates, such as anthracene oil, have given splendid results against the chicken mite and fowl tick. The latter still continues a menace to poultry raising in the South and it is continually invading new territory. It is especially well adapted to the conditions in the arid and semiarid Southwest, but its establishment in Louisiana, Mississippi, and Florida indicates its ability to adapt itself to the more humid sections of the country.

FIG. 192 Twenty seconds in the dip gives a 100 per cent kill of all kinds of lice present

The knowledge that this tick through its vicious blood-sucking habits often practically stops egg production in a flock, that it frequently kills grown fowls by gross infestation, that it is a carrier of a serious disease of poultry in other countries, and that individual fowl ticks have clung to life for three long years in the confines of a pill box without food or water, does not give a very comfortable feeling to the poultry owners of the vast area that is being invaded. It is believed that further research on this pest will make control measures more effective, but efforts to prevent further spread seem futile.

The efficiency of the sulphur-and-soap dip recommended for the destruction of the feather mite has exceeded expectations and each infestation of this destructive pest which has been reported has been promptly eradicated.

The Sticktight-Flea Problem

The sticktight-flea problem, which is especially serious to poultrymen in the South, has not yielded so easily to the efforts of entomologists. Segregation of pet animals from the poultry, the exclusion of fowls from beneath outbuildings, and the employment of creosote-oil sprays and salt-and-water applications to the breeding areas have given much relief but more investigational work is rightfully demanded. The ease with which the fleas are carried by wild-animal and bird hosts complicates the problem, especially among farm flocks.

Even with effective control measures at hand there are still those who, it would seem, like to be fooled or who are looking for a panacea or an easier way. This class of poultry owners is responsible for the enormous business done during the past few years by patent-medicine companies who would have us believe that the administration in food or water of a few drops of lime-sulphur solution or dry lime sulphur in tablet form would banish lice, ticks, mites, fleas, and all. Adequate tests have proved internal medication to be absolutely valueless against external parasites. The department has, fortunately, been able to check if not entirely eliminate fake remedies of this class from interstate commerce, though they are still being foisted on the public in some States.

The educational work carried on by the poultry section of the Bureau of Animal Industry and other agencies among the poultry raisers of the country has greatly stimulated interest in the keeping of better strains of fowls and their proper housing, feeding, and sanitation. This increased attention to the flocks has meant much in the campaign against external parasites.

Insect-free Flocks More Profitable

That the elimination of insects from a flock will net splendid increases in returns, often with lessened expenditures for labor and feed, is being demonstrated by hundreds of poultrymen. There is also an increasing desire, purely from a humanitarian standpoint, to relieve the fowls of the misery of continued attack by parasites.

With the desire for close cooperation that now exists between the research organizations, the extension agencies, poultry organizations, and individual poultry owners, we may look confidently for marked progress along this line of endeavor with an ultimate decrease in the hazards of poultry raising and a corresponding increase in the income on the millions of dollars invested in the industry.

F. C. Bishopp.

POULTRY Raising for Egg Production a Selection Problem Most farmers appreciate the fact that a well-kept flock of poultry pays as well, relatively, as most other branches of farming, and as a result interest in farm poultry raising has become widespread. Surveys conducted during recent years in a number of farm poultry-raising sections have shown that the larger portion of the poultry income is obtained from eggs. Special attention, therefore, may be given profitably to improving the laying ability of farm flocks.

The revenue to be obtained from the farm flock depends on success in breeding, feeding, and management. The factor of breeding may be considered the basis for success, for no amount of good feeding and proper management will make poorly bred hens lay many eggs. Good feeding, however, is also of great importance, for it is only through good feeding that a well-bred flock can respond efficiently. Lastly, proper management, which includes incubating, rearing, housing, and sanitation, is necessary to obtain maximum results from a well-bred and well-fed flock.

Winter Production Most Valuable

The correct basis for determining the worth of any hen as a layer should be not only the total number of eggs produced but also the time of production. Ten eggs laid in November or December are worth approximately 20 laid in April or May. According to the census, the average farm hen lays less than 60 eggs a year, principally from March to June, the season of lower prices. Here is great room for improvement in increasing the production of farm flocks. A study of the trend in the average monthly farm prices from 1910 to 1924 shows that lowest wholesale egg prices prevail in April, and that there is a slight increase in July and August, with a more perceptible increase beginning in September. The highest price is reached in December. The fall can be made the season of highest profits, provided there is good egg production.

What farmers should realize above all else is that although they can not control the price of grain or the price of eggs from season to season, they have considerable control over production.

The ability to lay eggs is inherited. To develop an egg-laying strain requires careful selection and the adoption of a consistent breeding policy. What is most needed is the development of winter layers. The average farm hen should not only lay at least 144 eggs in a year but most of them should be laid from October to March. Not only is this necessary for profitable production but from the standpoint of breeding it is highly desirable, because heavy winter laying pullets make the best breeders as yearlings.

Selection of Female Breeders

With a little care in the selection of female breeders the farmer can soon improve the quality of his flock materially. Selecting pullets to be used as breeders in their second year is relatively simple, if one observes his birds closely. Female breeders should be selected very carefully on the basis of constitutional vigor and freedom from the standard disqualifications, such as side sprigs and stubs. The farmer

should select females with bright, full eyes, combs and wattles of good texture, wide backs, and fairly deep bodies, and those that are well fleshed. Types of good layers are shown in Figures 193 to 196.

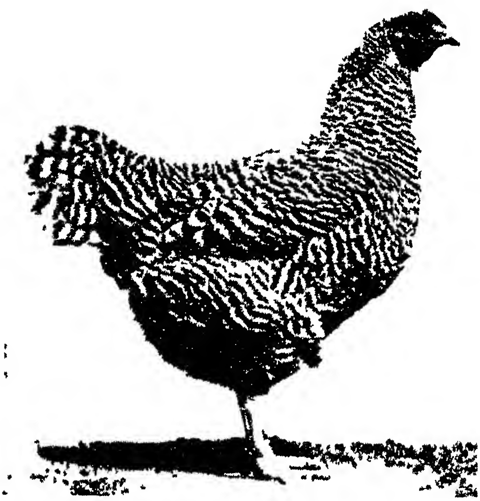

FIG. 193.—Barred Plymouth Rock No. 7129. First-year record, 226 eggs

In the development of a laying strain, four factors should be taken into consideration in observing pullets during the first laying year in order to select them properly for breeders the second year.

The first factor is that of earliness of maturity. When the pullets are put into the laying houses in the fall they should be observed carefully as to when they begin laying, which is easily determined by the relative development of the color of the comb and wattles, as well as the width of spread between the pubic bones. It is a simple matter to shut the pullets in their houses about once a week during the fall months when they are beginning to lay. By catching them, preferably in a catching coop, one can handle them readily and make observations. If they are in laying condition a cheap, colored, celluloid band should be put on one leg of each bird. Different-colored bands may be used for different times of the year, as, for instance, pink bands for birds that begin to lay in October, and blue ones for those that begin in November

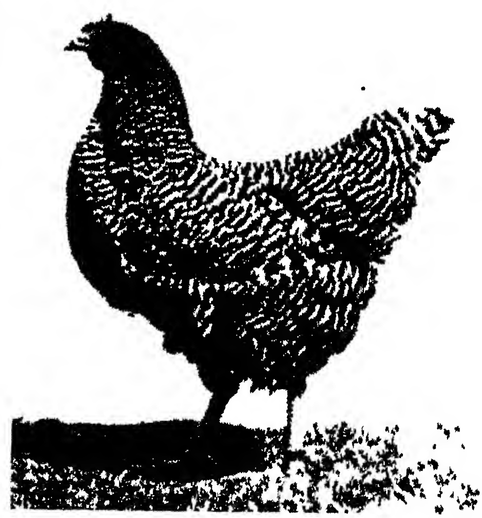

FIG. 194.—Barred Plymouth Rock No. 7196. First-year record, 246 eggs

Intensity of Production

The second factor in the selection of the laying hen is that of intensity of production. In breeds whose beaks and shanks are normally yellow, as in the Plymouth Rock, Leghorn, and Rhode Island Red, those pullets which lay with the greatest intensity after they begin will usually bleach out the normal color of the

beaks and shanks more quickly than pullets that lay only intermittently. Therefore, if the farmer observes his flock rather closely during the fall months he can readily determine those birds that are laying at the heaviest rate and they can be marked with celluloid leg bands.

The third factor is that of broodiness, which, however, does not usually apply in the breeding of Leghorns. Broodiness is inherited and sometimes is responsible for materially reducing egg production. In some strains it can be eliminated after a period of years of careful selection by observing the flock carefully during the spring months and marking, with colored bands, those birds which go broody most frequently. This procedure is easily carried out and will pay for any trouble taken in marking the most persistently broody hens.

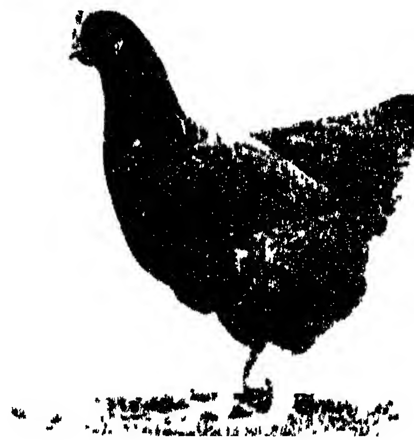

FIG. 195.—Rhode Island Red No. 1795. First-year record, 236 eggs

The fourth factor to be considered in the selection of pullets to be used as breeders in the second year is that of persistence of production in late summer and fall, combined with the time and rate of molting. It has been demonstrated, for instance, that the laying pullets which molt early in their pullet laying year are usually poorer layers than the ones which molt late in the fall. Also, the early molter ceases egg production early in the summer or fall, whereas the late molter persists in laying well throughout that period and thus makes a good annual record. Differences in persistency of production among birds are also readily demonstrated by the bleached appearance of the beaks and shanks.

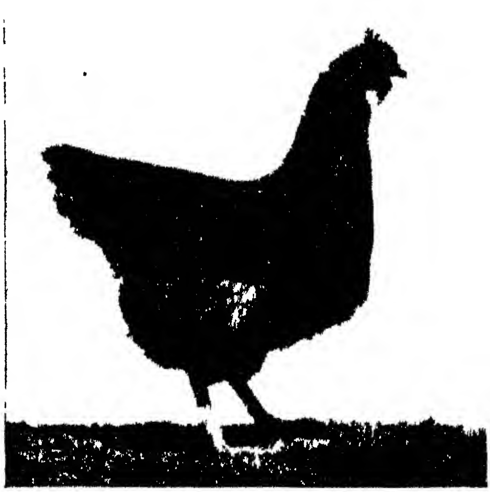

FIG. 196.—Rhode Island Red No. 5059. First-year record, 209 eggs

Selection of Male Breeders

The selection of male breeders is relatively more important than the selection of female breeders, because the offspring of each male constitutes one-half of the heritage given to all the offspring.

It is desirable, of course, to select male breeders from females that have proved to be good layers and breeders. But this involves trap-nesting the breeding stock and pedigreeing the chicks and is not advocated for the average farm because of the extra labor and cost. It is possible, however, for a farmer to select good male breeders from his flock of cockerels each year by observing them closely and noting particularly those which possess the best type for breeding, have the greatest constitutional vigor, mature early, and have good handling qualities, such as fine texture of skin and good quality of bone. By carefully selecting such male breeders each year one should be able to increase steadily the production of the pullet flock each succeeding year.

It would be highly advisable for farmers and other poultry keepers to purchase one or more good male birds from recognized high-laying strains. When the quality of stock can be depended on, this method will get more immediate results than endeavoring to build up a strain from one's own stock. Be very sure, however, in purchasing male birds to obtain stock of high quality.

M. A. JULL.

POULTRY Roundworms Vary Much in Size and Mode of Living

In that class of the animal kingdom to which the parasites known as roundworms (nematodes) belong, the individual members show the greatest diversity of size and shape of body and also of living quarters preferred by them. In size they range from pygmies to giants, as we look at things. Of those that are found living as parasites in birds, the pygmy size is represented by minute worms which are sometimes found traveling about in the blood stream, the microscope being necessary to aid one in seeing them, and also by another kind of worm, found in the glandular stomach, of which the male worms are so small that they can seldom be found unless a magnifying glass is used. On the other hand, the giants among the roundworms are represented by one which averages a little over 3 feet in length and lives among the tissues in the body cavity of the ostrich.

Appearance Sometimes Deceptive

In shape roundworms, as their name implies, are usually elongate and cylindrical, but the name is deceptive in some instances; a roundworm found in the glands of the stomach of poultry and other birds is practically globular, with a small projection, the head, at one side, and another, the tail, on the opposite side. This globular roundworm, however, is as slender as any other in its youth and it is only the females which acquire this rotundity as they become mature, because huge numbers of eggs develop within the worm and completely change its shape, its color also changing from white to a brilliant red; the males continue to be of the shape and color which is usual for a roundworm. The contrast, however, between this fat, globular, bright-red female and the male of the same species, or between it and an extremely slender, colorless, hairlike roundworm, such as is often found in the intestines and in other parts of the digestive tract of chickens, is very striking and one would not assume them to be near relatives, as the former looks and acts more like a chigoe flea than a roundworm.

As to the living quarters which are chosen by different roundworms when they settle down in the various parts of the body of the bird, there is wide diversity, showing that the tastes and dispositions of these tenants vary greatly. Various roundworms of birds may be found in the eyes, in the windpipe and lungs, in the blood stream, in all parts of the digestive tract, in the body cavity, and even buried under the skin or in the narrow confines of the cavities of the joints. However, although there are these many sites inhabited by different roundworms, each species of worm has a definitely preferred place and can seldom adapt itself to a different place in the body.

Direct and Roundabout Modes of Infection

Still another phase of the life of these roundworm parasites which shows considerable variation is the manner in which they gain entrance into the body of the bird that is to act as their host, and it is this phase that is of the greatest practical importance to the farmer. Some travel directly from one bird to another by means of the worm eggs which pass out in the droppings of an infested bird and are later swallowed by another bird. Others can not go by this direct route, but must go as worm eggs from one bird to some insect or other small invertebrate, or to a different kind of vertebrate, such as a fish, and then get to a bird when the bird eats this insect or other animal. Others must be taken from the bird in the worm's larval stage in the bird's blood by a bloodsucking insect and then be conveyed to another bird by the bite of the insect.

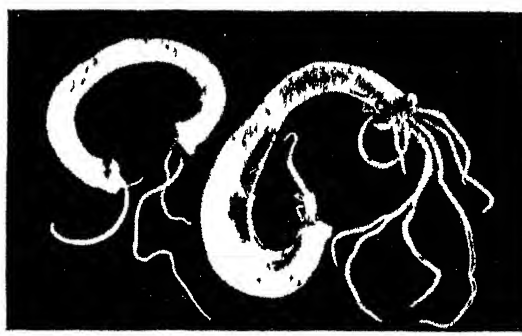

FIG. 197.—Sections of intestines of a fowl heavily infested with large roundworms. (After Bradshaw)

The most frequently found, and therefore the best-known, roundworm of chickens measures from 3 to 4 inches in length. It occurs in the small intestine, sometimes in such numbers as to block seriously the passage of food. (Fig. 197.) This roundworm develops in the bird as a result of the eggs of the parasite having been taken in with food and water on premises contaminated by the droppings of other fowls already harboring the worms. One female worm of this species may produce as many as 1,500 eggs, which are passed out with the droppings of the bird, and since a single chicken has been known to harbor as many as 125 of these worms, it is easily seen that the number of eggs which may find their way to the soil of the chicken lot may be immense.

Since these eggs represent the possibility of future infections among the chickens of the flock it is clear that the spread and increase in numbers of these worms may be easily brought about under ordinary conditions. The cecum worms found commonly in poultry are spread in a similar manner, as are also the capillarids, slender hairlike or

threadlike worms which are found in the upper and also the lower digestive tracts. The eggs of gapeworms, which are located in the windpipes of poultry, are coughed up and swallowed, later passing out in the droppings.

A matter of great practical importance in connection with the manner in which worms are transmitted is the fact that gapeworms are commonly spread to young chickens by turkeys. The turkey serves as a carrier of the parasites, infecting the premises with the worm eggs, which the chickens then pick up. The adult turkey is very little affected by the worms, but the young chicks which thus acquire the infection from them suffer very severely from gapes. It seems to be true that as a rule when parasites develop in a host other than the usual one they do more damage there than in the usual host, presumably because the latter have developed a certain immunity from centuries of parasitism. Keeping turkeys isolated from chickens is therefore an important factor in preventing gapeworm disease of chickens. (Fig. 198.)

FIG. 198.—Large masses of gapeworms in the windpipe of a young chicken

Intermediate Hosts Sometimes Necessary

Whereas the roundworms mentioned above are capable of going directly from one bird to another, with a more or less protracted stay of the egg in the poultry lot between times, there are other roundworms which demand what is termed an intermediate host before they can spread from one bird to another. Thus one of the worms referred to as living in the glands of the stomach, the female becoming red and globular, spends the earlier part of its life in the water flea, the latter having eaten the eggs of the parasite in the droppings of poultry. The water fleas being swallowed by these birds in feeding or drinking, the young worms contained in the water fleas reach the bird's stomach and there develop. Similarly, with another roundworm of the glandular stomach of chickens and pigeons, with gizzard worms, with a worm found sewed into the walls of the esophagus, and with the eye worms of poultry, some kind of intermediate host is necessary. Often the identity of this intermediate host is not known, but beetles, roaches, ants (fig. 199), and other insects are known to serve for certain worms.

Bloodsucking insects are the intermediate hosts for other types of roundworms, the young worms getting into the blood, being taken in by the insects in biting, and then conveyed to other birds when the latter are bitten by these insects. Fish-eating birds have parasites which pass the first part of their development in the fish and complete their development when the infested fish are eaten by the birds.

Although there are these numerous differences in the location of roundworms in the body of birds and differences in the way they are

spread, the matter of control of roundworm parasites found most commonly among poultry in this country depends on the efficiency with which the eggs of the parasites are prevented from spreading, since the most common worms are those with a direct development. The most satisfactory preventive measure for these worms is sanitation. If poultry lots are kept clean and dry, if the soil is ploughed occasionally so as to turn the contaminated surface under, if clean feed and water are provided for the birds, and if the droppings are disposed of, so far as possible, in such a way as to keep them and

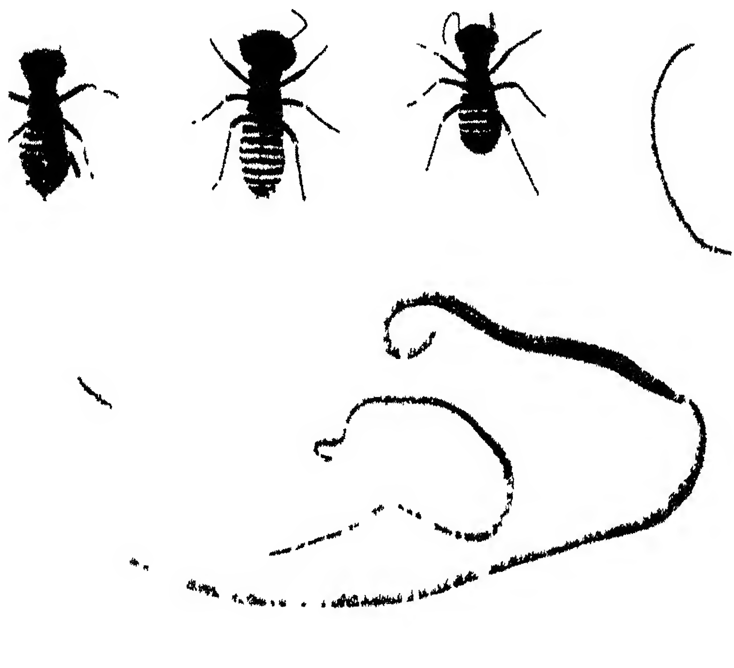

FIG. 199.—A worm parasite of chickens and its intermediate host, a large ant. One ant shows the larval worm escaping from its body. The size of the larval worm is shown at the right. Below are the fully grown male (the smaller) and female worms. (After Theiler.)

their content of worm eggs away from birds, the journey of parasite eggs from one bird to another will be made a difficult matter, if not entirely prevented. The majority of these parasites of poultry will be greatly reduced as a result. In the case of nematodes conveyed by intermediate hosts, the problem is more complex; a definite knowledge of the life history of these worms is necessary first of all and then control measures must be devised to prevent birds from eating the intermediate hosts or being attacked by such bloodsucking forms as may convey roundworms by their bite.

ELOISE B. CRAM.

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PRUNE Wants Vary With Nationality of Consumers in U. S. All prunes are plums but all plums are not prunes. Prunes are a type of plums which possess certain characteristics which allow the plums to go through the drying process without fermenting if the pit is not removed. Most plums would ferment during the drying process if dried with the pits remaining in them. In the fresh state, prunes usually are drier and firmer of flesh than are other plums. They have a higher sugar and usually more acid content than other plums and are likely to be somewhat astringent until fully ripe.

Prunes are shipped and sold in both the fresh and dried state, but the greater proportion of the crop is marketed after it has been dried. It is in the dry state that the fruit is recognized by the consuming public in general.

Most of the dried prunes consumed in the United States are produced in certain areas of the Pacific Coast States. Only a few varieties are grown, the most important of which are Agen, commonly known as the French or Petite, and the Italian. Among other varieties are Imperial Epineuse, Sugar, and Robe de Sergeant. The Agen is produced commonly in California and the Italian mainly in Oregon and Washington, although some Agens are grown in the latter States. The other varieties mentioned are produced in California. Frequently the fruit is known by the name of the area in which it was produced, for instance, the Agen is often called the California or Santa Clara prune and the Italian is often called the Oregon prune.

The Agen (French or Petite) prune has a fine flavor, a high percentage of sugars and solids with a firm sweet flesh which requires little or no sugar in cooking. The Italian prune is finely flavored with firm flesh, free stone, and a somewhat higher acid content than the Agen. The higher acid content of the Italian prune gives it when cooked a pleasing tart flavor not unlike that of the fresh fruit. Of the other varieties none have the tart flavor of the Italian but are usually all more or less sweet like the Agen. For all practical commercial purposes prunes may be divided into two kinds, namely: The sweet prune represented generally by the Agen, and the tart prune represented by the Italian.

In a recent study it was found that the demand for prunes comes from consumers in all walks of life. Those whose incomes are small use prunes because they are cheap and those of medium and large incomes use them because they like them and because they are healthful.

Nationality in Consumer Preference

The nationality of the consumer influences the market preferences. The demand in the larger markets for the sweet prunes comes generally from the native-born American people, whereas that for the tart prunes comes generally from the foreign born, particularly from those of central European or Jewish origin.

Market preference is also affected by price. It was found that the tart prune was generally selling at a lower price than the sweet prune. Consequently persons in the larger cities to whom a difference of a few cents in the cost per pound is of consequence generally purchase the cheaper prune. Except in New York, Chicago, and a few other cities where large foreign-born populations are centered the

preference for either kind of prune is not confined to any particular class or group of people.

That the general consumer is not familiar with varieties and kinds of prunes was demonstrated by the replies received in interviewing several hundred housewives in New York, Chicago, Minneapolis, and St. Paul.

In most instances the preference for tart prunes was expressed by the Jewish housewife. In New York this was especially true among the older generation, but it was indicated the Jewish housewife of the younger American-born generation preferred the sweet or California prune. On the other hand some American-born consumers who had been accustomed to using the sweet prunes had become acquainted with the tart prunes and now preferred them. These replies indicate that the individual preferences may change.

R. G. Hill.

PRUNES are Meeting Strong Competition in Foreign Markets As about 45 per cent of the prunes grown in the United States are exported it is important to keep informed on the competition encountered in our foreign markets. Exports of prunes from this country are on a higher level than ever before. During the 1926–27 season our shipments abroad reached the record figure of 175 million pounds. This compares with average exports before the World War of about 80 million. Our principal foreign markets are found in northern and central Europe where prunes constitute an important item of food, particularly during the long winters when supplies of fresh fruit are limited and high in price. Yugoslav and French prunes compete with the American product in these markets.

The production of prunes in Yugoslavia, since the establishment of that country at the end of the war, has fluctuated between about 60 and 170 million pounds, with an annual average of about 140 million. This compares with an average production in California of about 300 million pounds and in the Pacific Northwest of about 55 million. The principal producing regions in Yugoslavia are found in Serbia and Bosnia where plum trees were originally planted to furnish fresh fruit, particularly for the making of brandy.

The prune industry was a later development, and the peasants today dry the plums only after their supplies of brandy are assured. Nevertheless, there have been large plantings of seedlings since the war, although most of these seem to have been of a variety of plums better suited for the making of brandy than for use as dried prunes. Increased interest in the prune industry is indicated by Government subsidies to plum-tree nurseries and regulations which have been drawn up for the purpose of improving methods of curing the fruit and preparing it for market.

The possibility of increased marketing of boxed prunes, particularly to Germany, is receiving much attention. During recent years practically all of the Yugoslav prunes have been shipped to Germany in bulk, but hopes of increasing greatly the trade in boxed prunes are now entertained as a result of the reduction in the German tariff on boxed prunes. It seems probable that Yugoslavia will continue to offer as much competition to American prunes in European markets in the future as in the past and the competition may increase.

The Yugoslav prune has a flavor midway between the sweet French prune from California and France and the tart Italian prune from Oregon. It is sometimes claimed that Germans and other consumers in central Europe prefer this slightly tart flavor and that consequently Yugoslav prunes have an advantage over California prunes, but not over those from Oregon, in these markets. On the other hand, American prunes usually have an advantage in quality, in so far as it relates to curing the fruit and preparing it for market. In most European prune markets, however, price as affected by supplies is the dominating factor and determines largely the relative amount of prunes taken from the various producing regions.

As production of prunes in France has been declining for years, there is little reason to expect increasing competition from that source. The French prune output has fluctuated greatly from crops as low as 3 to 4 million pounds to crops ten times that large. In years when the output is large, French supplies in European markets are of significance to American prune exporters. France is unique in being an importer of prunes as well as a producer. Even when the local production is large a considerable quantity of American prunes are imported, and a smaller quantity of Yugoslav prunes. France exports carefully packed prunes of high quality, principally to the United Kingdom and South America. These expensive packs do not compete seriously at present with the American product.

Rumania, Australia, and South Africa produce prunes but the output of these areas that reaches competitive markets is of little importance at present. Fairly large quantities of Rumanian prunes of inferior quality are exported in some years to Germany and Poland, particularly to Poland. Only a small part of the large quantity of the prune plums grown in Rumania are dried as they are used primarily for brandy, jam, and fresh fruit. Prune production in Australia and South Africa is at present limited but these countries represent areas from which Great Britain, second only to Germany as a market for American prunes, may in the future get a considerable part of its supplies.

L. A. WHEELER.

PUBLICITY on Farming Industry Grows With Growing City Interest In 1927 approximately 300 articles dealing with agriculture or rural life appeared in the 105 magazines indexed in the Readers' Guide to Periodical Literature. This record -practically three articles to each periodical—speaks emphatically of the interest taken by the public generally in farm problems. That this interest, further, is of increased intelligence, is indicated by the fact that almost all the articles deal with subjects of actual significance, presented with authentic data. A substantial proportion of the articles treats of economic problems, especially marketing. The vague sentimentality characteristic until recently of nontechnical writing on farming and rural life, is largely absent.

A similar interest in agriculture is manifest in the daily and weekly newspapers. In the daily press particularly, the contrast with earlier practice is marked. For example, the New York Times Index from October, 1926, to September, 1927, inclusive, contains approximately 550 entries under "Agriculture." Five years previous, the annual total was less than 100; 10 years previous, under 20.

The demand for farm relief legislation, due to the agricultural depression, is doubtless responsible for much of the increased publicity given to agriculture by newspapers and periodicals. The widespread discussion of farm aid, stimulated by the controversy over it, has aroused the interest of countless thousands of urban readers, and has made them ready to study agricultural problems in general.

During the past year, the agricultural press has continued its emphasis on marketing without neglecting fundamentals in production. The number of agricultural journals listed in Ayer's Newspaper Annual and Directory diminished in 1927 from 536 to 508. This decrease is in line with the general publishing tendency in all fields, caused mainly by advance in publishing costs.

A Notable Innovation

Perhaps the most notable innovation in the agricultural publishing field occurred in England, with the founding of The Countryman, a quarterly illustrated review of rural life, by J. W. Robertson Scott. This gives to agriculture for the first time a journal which, while scholarly, is humanistic rather than technical, and comparable with the notable literary, political, and theological reviews. The material in the publication is written by country people. While the review deals primarily with English conditions, other matters are also discussed. The philosophical background in The Countryman is of interest to any serious student of rural life.

Books on agriculture published in 1927 deal to a large extent with economic and sociological problems. The results of detailed economic research are presented in several works. Two of these publications are from the Institute of Economics—Industrial Prosperity and the Farmer, by Russell C. Engberg, which concludes that business cycles are not responsible to any considerable extent for the farmer's financial situation; and The Legal Status of Agricultural Cooperation, by Edwin G. Nourse, which discusses the economic objectives of the cooperative movement and the way in which they have been or may be properly recognized in legislation. Clara Eliot, in The Farmer's Campaign for Credit, summarizes the efforts of recent years in the United States to provide a credit system adequate to the needs of agriculture.

Among general works dealing largely with the economic problems of farming are These Changing Times, an account of the development of agriculture and rural life since 1900, by E. R. Eastman, who offers a generally optimistic outlook; Balancing the Farm Output, by W. J. Spillman, treating of proposed plans for adjusting production to market demand; and Farm Income and Farm Life, a symposium under the auspices of the American Country Life Association and the American Farm Economics Association. The symposium yields the general conclusion that economic and social factors interact in rural society, neither group being specifically the cause of the other.

An interesting development in the economic and sociological literature of agriculture is the publication of two elementary textbooks, Macy Campbell's Rural Life at the Crossroads, and Macklin, Grimes, and Kolb's Making the Most of Agriculture.

Fundamental Values in Farming

The year 1927 was further marked by another of Liberty Hyde Bailey's philosophical works on agriculture. His new book, The Harvest of the Year to the Tiller of the Soil, applies to contemporary problems his doctrine of the holiness of the earth and the significance of the individual farmer. Standing firm for an adequate economic return to the farmer, Doctor Bailey at the same time recognizes that the fundamental values in farming are not financial. In touch with modern agricultural technique, he yet realizes that to this, if it is to attain its maximum usefulness, personality must be joined. Like W. C. Brownell in urban life, Doctor Bailey in rural life stands out as a firm believer in democracy against the many recent attacks upon it.

In the fiction of rural life, the year was notable for the absence of novels presenting farmers in their organizations. Several such books in the preceding year or two had led readers to expect a steady development in this field.

Emphasis on the land as a force shaping character is found in practically all the agricultural fiction of the year. This is true of Sarah Comstock's Speak to the Earth, a story of a sheep farm in western South Dakota; Mary Ellen Chase's Uplands, whose locale is Maine; Alice DeFord's Singing River, another New England novel; and Ben Ames Williams' Immortal Longings, a story of the Maine hills. The spirit of the soil is less prominent in Martha Ostenso's Mad Carews—which deals with a rich family in the wheat lands of Minnesota—than her earlier work might lead one to expect. Nor is it conspicuous in My Heart and My Flesh, by Elizabeth Madox Roberts, which after all is only incidentally a rural novel.

It is notable that five of these six novels are by women. Moreover, these five all make women their strongest characters, while in Mr. Williams' novel a woman occupies a prominent, though not the leading, place. The tendency to lay stress on the importance of woman to rural life, which has been observable in American fiction for some years, thus reaches a climax.

What is probably the outstanding rural novel of the year is, like other outstanding things, not readily classifiable. Giants in the Earth, by Ole Edvart Rolvaag, is an epic story of pioneer life on the plains of South Dakota. Professor Rolvaag, who is head of the department of Norwegian language and literature in St. Olaf College, knows the life with which he deals, and this fact is manifest on every page of his book. In it are presented the objective doings of a pioneer family and the pioneer psychology as they have been seldom revealed in American literature.

Nelson Antrim Crawford.

RADIO Reports of Livestock News Need the Hearers' Criticism

Extension of rural mail routes, telephone lines, and good roads, and the use of automobiles, have all played their part in putting the farmer in closer touch with city life. It remained for the radio, however, to break down the last barriers of isolation on the American farm and bring the city to the country. The farmer regards his radio essen-

tially from the utility standpoint because of its usefulness in receiving weather and market reports.

Interest in the distribution and marketing side of the farmer's business has been greatly stimulated by the shifting economic conditions of recent years. With that has come a clamorous call for market reports. The United States Department of Agriculture has a corps of highly trained market reporters covering some 25 livestock markets of the country and at virtually all of these points these reporters prepare market information for radio distribution.

After the reporter and the broadcaster have done their parts, much of the success of this unique means of dissemination of livestock market news depends upon the listener. The listener should find out how much and what kind of livestock market information is available from the station or stations to which he listens regularly. It would be of benefit to the station and to those preparing market reports if the listener would send in suggestions or constructive criticisms. Heretofore it has often been necessary for the broadcasting station to plan programs of livestock market reports in a blind fashion, without consulting the rural listener. If reports seem to cover too much ground in the time allotted, it is well for the listener to let the station know that. Reports should be concise and to the point, with just enough detail regarding the different classes, weights, and grades of stock to give a clear picture of what is happening at the stockyards. But the listener is the judge as to whether that aim has been achieved.

Banks, elevators, country shipping associations, and newspapers frequently post radio market reports on bulletin boards for the benefit of their patrons. Some persons sit down at their receiving sets, especially during the early evening market broadcasts, and on a good sized sheet of paper, lined and ruled for the purpose, jot down the essential information on the day-to-day trend of prices and receipts. This is a great help in keeping posted on market fluctuations and in studying the cyclical and seasonal trends, and helps them to answer calls from neighbors or friends who are without radios.

The listener can make better use of the reports if he has a working knowledge of the department's standard classes and grades of livestock. The same general classification for cattle, hogs, and sheep is used by all of its livestock reporters throughout the country.

A. B. Smeby.

RASPBERRY of the Van Fleet Variety Thrives in South

The Van Fleet raspberry resulted from a cross of *Rubus innominatus*, a wild Chinese raspberry, with the Cuthbert red raspberry, made by the late Walter Van Fleet of the United States Department of Agriculture in 1910 and is the first hybrid between the common cultivated raspberries of the United States and one of the scores of wild species of raspberries of Asia to be commercially introduced. This new variety has a much larger bush than any other cultivated raspberry; it is free from anthracnose and is very resistant to the common leaf spot; its fruit does not decay as quickly as that of other varieties; it produces many large clusters up to 200 or more fruits each; it ripens after the season of other red raspberries is past and continues in season for about five weeks; its seeds are much smaller than those of

Fig. 200.—The Van Fleet raspberry. A, A plant trained to a stake about 6 feet high. B, the same plant after pruning. C, fruit cluster

other sorts; and it is adapted to the South where no other raspberry succeeds. These characteristics make it extremely valuable. Its weak points are that its fruit is of only medium size and rather soft; its quality, though good, is not equal to that of the Cuthbert; and its canes are mildly susceptible to injury by the apple bitter-rot fungus and the spur-blight organism.

This variety has been widely tested in the Southern States and is apparently adapted to that part of the United States from Maryland south to northern Florida and west to southern Missouri and eastern Texas. It is being tested in California and may prove of some value in the warmer interior valleys where the red raspberry does not succeed. It is recommended for home use and the local market. It is especially prized by restaurants because of the resistance of the fruit to molds, which results in a minimum of loss when it becomes necessary to hold the fruit from one day to the next.

Plants are not available from the Department of Agriculture but may be obtained from nurserymen. Further information on this variety is given in Department Circular 320.

GEORGE M. DARROW.

RESEARCH Utility Not at Once Measurable in Dollars and Cents

No one can long pursue pure research without being asked "What is the good of that? Will it be of any practical value? Will it pay?" This is quite as sensible as it would have been to ask John Keats "What is the use of that ode? What will you get for it?" As to poetry Francis Thompson replied that a poem was at least more useful than soap, for men got along without soap for ages, and very well indeed, but they found poetry quite indispensable.

There is also an answer to the question regarding the utility of pure research. The answer consists of another interrogation. Benjamin Franklin, "the first civilized American," asked it and it is the most effective retort as yet invented. It is, "What is the utility of a newborn babe?" Recently, of course, Raymond Pearl has demonstrated that a newborn babe is a financial asset, however much some parents beg to differ. The same applies to the purest research, in time. It is an asset immediately; ultimately it becomes a financial asset. But more interesting really than the profits to accrue from knowledge is the romantic process whereby it is gained and correlated.

Once a certain curious investigator found that proteins are broken down by digestion into about 20 simple substances called amino acids. That explained a great many mysteries at once. It told much of the upbuilding and down-breaking of body tissues. Later another investigator showed that these amino acids floated around the organism in the feeding and heating system—i. e. the blood stream. This led to the suspicion that the cells of the organism here and there reach out and withdraw from the blood stream the particular amino acids they need to build tissue in their vicinity, and that the bodily proteins are built up by some such subtle alchemy in ways even as yet ill understood.

Utilitarian End Not Immediately Seen

So much had been gained. But just what all this had to do with making money or with helping farmers it was difficult to see. It was vastly interesting of course, but . . . Since a cow is a mammal these amino acids also cruise around in her blood and since she gives milk it is reasonable to suppose that some of them, derived from her food, ultimately go to build her milk proteins. If we knew just what amino acids were concerned in this we might eventually feed the milch cow more intelligently.

So it was that a department research worker one day set to work to discover how he could accurately estimate 1 of these 20 amino acids in the blood—tryptophane. He picked on tryptophane because it is known to be an important protein builder. He perfected his method of analysis and proved that blood leaving the mammary gland contains less tryptophane than blood entering, provided the gland is in active secretion. This showed that tryptophane from the blood stream became a component of milk proteins in the mammary-gland tissue; in short, that blood amino acids are precursors of milk proteins. He had shown all this, and how—not to say how much—for science is an exact jade. This work took place in the Bureau of Dairy Industry. C. A. Cary carried on the work.

But what profited it? Immediately an effort was made to determine yet another amino acid in the blood, the only one containing sulphur, cystine. Another investigator in the department undertook this as part of the larger problem of determining the nutritive principles from feed through digestive tract, to blood stream, to milk secretion. But this investigator found instead two amino acids—cystine and glutaminic—traveling together, wed as one in a dipeptide called glutathione. This dipeptide passed out of the mammary gland into milk protein as such, a very interesting and unique observation in itself.

At once a whole field of work opened up. Glutathione is an important substance in the organism, discovered by F. Gowland Hopkins, of Cambridge, England, found in sheep blood by Holden, of Cambridge, in pig blood by Hunter and Eagles at Toronto, in cow blood by Harding and Cary, of the United States Department of Agriculture, and studied also by Voegtlin and coworkers at the hygienic laboratory. While it was important, its constitution was in dispute and no single investigator had ever had much of it to study. The idea arose of getting two or more investigators to work on the problem cooperatively. Eagles was now at Yale with T. B. Johnson. The United States Department of Agriculture undertook a joint project with Yale to process 600 gallons of pig blood at a commercial plant. This work was done in the summer of 1927 and the lead compound of glutathione prepared in very crude form.

Glutathione Prepared for Study

In time the largest amount of glutathione and its hypothetical associated products ever available anywhere will be prepared for study and identification. The possibilities are boundless and the problem is of the highest importance although even yet no immediate practical applications can be anticipated. Recent work has, it is

true, tended to show that the sulphur of insulin occurs in the form of glutathione while glutathione has been shown to have certain other therapeutic uses as an antidote for certain toxins. The dipeptide is also known to be concerned in the oxidation-reduction processes of the organism in a specific manner as yet to be determined. Problems in pure organic chemistry and in nutrition investigation also loom before us.

All of these investigations prepare the secure foundation of pure observation and unindoctrinated data upon which alone practical science can build. As observation is added to and correlated with observation and as generalizations become possible in a larger and larger sense, practical applications and economic values will arise inevitably and as matters of course. But the surest way to blight the advance of science is to demand a dollar for dollar accounting of research and to time it meticulously.

It would generally be recognized as absurd for anyone to walk in upon an artist and say, "Now it's just 9.30. I want that angel's wings completed by quarter past 12 and then you make me an exact estimate of what your painting is worth and where we can sell it." It would have been just as absurd for some one to ask Banting when he would have insulin perfected and how much it would be worth when his work was done. Furthermore, we are willing to grant that a painter will every so often fail to produce a masterpiece and may now and again produce a complete and worthless failure. We must grant the research worker the same liberty.

The utility of a new piece of pure research is that of a newborn child—interesting per se, boundless as space in its potentialities, limitless as time in its final results and ultimate effects. Is that not enough?

T. Swann Harding.

RICE-CLEANING Device Attached to Thresher Promises Big Saving

A device for cleaning rice and grain at the time of threshing has been developed in the department. When in use, it is attached to the threshing machine and operates automatically as a part of the thresher. The device is known commercially as the Bates aspirator. A public-service patent makes it available to anyone in the United States without the payment of any royalty.

Rice as it is harvested and threshed ordinarily contains a considerable amount of empty paddy kernels, loose and broken rice hulls, lightweight weed seeds, pieces of straw, and chaff. This material must be removed from the rice before it is milled if best milling results are to be obtained, for if such material is milled with the rice it will cause a reduction in milling yields, and the weed seeds will cause a reduction in the quality and value of the milled rice products. In addition, the presence of such material adds somewhat to the cost of milling and to the cost of handling, storage, and freight.

Buyers of rough rice carefully examine each lot of rough rice offered for sale to determine the amount and kind of material of this nature that may be present before making a bid on the rice. Clean rough rice which is free of weed seeds, empty paddy grains, loose

hulls, chaff, etc., almost invariably sells at a higher price than does rice that contains such material. The reduction in price usually depends upon the amount and kind of the objectionable material that is present in the rice.

Rice farmers both in California and in the South could add very materially to their income each year by cleaning their rough rice on the farm, before it is sold on the market.

Because most of the rice which is produced in the United States is handled in sacks, and because much of the rice that is handled in bulk is hauled directly from the threshing machine to a mill or elevator and sold immediately, it is not convenient for individual farmers to clean their threshed rice before marketing it. A lower price is received for the rice than would be the case if the rice were clean.

Cleaning Without Extra Handling

With the Bates aspirator attached to the threshing machine each farmer can have his rice cleaned at time of threshing and the cleaning can be done without extra handling of the rice and without loss of time. That this can be done successfully was demonstrated in 1926. A large rice grower in California accepted the recommendation of the Department of Agriculture and equipped one of his three threshing machines with a Bates aspirator and used it all during the threshing season. Investigators took 13 sets of samples of the rice that was threshed with this machine One sample of each set was of the threshed rice before it passed through the aspirator; another was a sample of the rice after having been aspirated; and the third was a sample of the material that was removed from the rice by the aspirator. These samples were analyzed in the United States grain-investigations laboratory and the results were tabulated.

The analysis of the samples showed that as a result of the cleaning which the rice received by passing through the Bates aspirator the percentage of whole rough rice kernels was increased, on an average, by 2.7 per cent; hulls and other foreign material were reduced by 2.6 per cent; and the test weight per bushel of the rice was increased 2.2 pounds per bushel.

In a report to the department this farmer stated that because of the favorable results he had obtained with the Bates aspirator and because its use had improved the working conditions around the threshing machine (through the collecting and removal of the dust), he was equipping his remaining two threshing machines with the aspirators. Several other rice farmers in California equipped their threshing machines with the Bates aspirator during the 1927 threshing season.

The Bates aspirator works on the principle of suction. As the rice is thrown from the thresher elevator it enters the aspirator and is spread into a thin even strem by being directed on to a low inverted cone. The cone is so held as to cause the rice from the elevator to pile up and flow evenly over its edge. A suction from above the pile of rice draws a current of air through the thin sheet of falling rice and lifts from the stream of rice such light material as can be removed by the current of air. The cleaned rice stream then unites in the funnel below and continues in its normal path.

The foreign material removed from the rice by the aspirator can be collected by means of a cyclone dust collector, or can be discharged onto the straw pile or on the ground at some out-of-the-way point, to be sacked or disposed of at a later time.

E. N. Bates and
George P. Bodnar.

Rice Grown in U. S. Finds Good Market in Foreign Countries

Except in certain regions in the South, rice has never been a staple item in the American diet. Because of our relatively low per capita consumption, we usually have a considerable quantity of rice to ship to noncontiguous territories and to export. The production of rice in the United States, which before the World War was insufficient for domestic requirements, was greatly stimulated by the war. The low price of rice in the period 1920 to 1922, however, discouraged rice production and in the years immediately following the exportable surplus was much reduced whereas imports increased. In 1926 another large crop was raised and the exports reached the level that prevailed five years before.

In studying the foreign markets for American rice it is necessary to make a sharp distinction between the short-grain Japanese type of rice produced in California and the longer-grain rices grown in the Southern States, primarily Louisiana, Texas, and Arkansas. The difference in the markets to which the rice from these two producing areas go is marked.

The largest outlet, outside of the United States proper, for southern rice is found in Porto Rico. The per capita consumption of rice in Porto Rico is twenty-five times as large as in continental United States. As Porto Rico is a territory of the United States, it is a protected market and even in years when prices for rice in the United States are relatively high, that market will absorb considerably more than 150 million pounds of American rice. In other markets in the Caribbean trading area the southern rice must meet the competition of rice from the Orient. Cuba is an interesting example of such a market. Rice is a staple item in the Cuban diet and the demand is at present largely satisfied by the low-priced Asiatic rice. Price is a much more important consideration than quality in Cuba, for rice is used there largely in combination with other foods and when served plain is usually tinged with saffron. But the Cuban consumer insists that rice be loose grained after cooking, and Asiatic rices satisfy this requirement better than does most of the rice produced in the South. It is for this reason, together with the fact that the Oriental rice is usually considerably cheaper than American, that French Indo-China and Burma are the principal suppliers of rice to the Cuban market.

Other Markets for Southern Rice

Other important markets for southern rice are located in Europe and South America. In Europe the principal importers of American rice are Great Britain, Germany, the Netherlands, and Belgium. In all these markets strong competition is encountered from rice grown in Indo-China, Siam, and Burma—the principal surplus-pro-

ducing areas in the Orient. It is only in years when the production in this country is large and the price low that any considerable quantity of American rice is imported by Europe. Outside of the Carribean region and Europe the only important markets for southern-produced rice are Argentina, Chile, and Canada.

California rice also finds its best overseas market in an American territory, in this case Hawaii. The California rice is of the Japan type and the large number of Japanese living in Hawaii accounts largely for the heavy shipments to that market. As in the case of Porto Rico, the Hawaiian market is a protected one and American rice thus has an advantage over supplies from foreign sources. Japan is the outstanding foreign market for California rice and the prosperity of the rice industry in California in years of large crops depends to a marked degree upon the quantity and value of the rice imported by Japan. The amount of foreign rice absorbed by this market depends upon the domestic production, which never equals domestic consumption, and the production in the colonies of Formosa and Chosen. All these regions produce the Japan type rice, which is much preferred by the Japanese consumers. When production in all three regions is large, little foreign rice is needed in Japan. When the crop turns out badly in one or more of these areas, a considerable quantity of foreign rice is needed and California rice is preferred over that from other foreign sources. In addition to whole rice, California exports large quantities of broken rice to Japan.

L. A. WHEELER.

RICE Yield Increased in California by Ammonium Sulphate

Virgin rice land in California, when properly prepared, sown with an adapted variety, and irrigated in an approved manner yields from 4,500 to 6,000 pounds of rough rice per acre. The second-year crop may yield from 3,500 to 4,500 pounds per acre, while a third successive crop yields from 2,500 to 3,500 pounds per acre. This rapid decrease in acre yields appears to be associated with a deficiency in the nitrogen supply of the soil, as well as with competition from noxious weeds.

Soils which are submerged with water from four to five months during the rice-growing season and often kept saturated by precipitation during the fall and winter months, are not in a favorable physical condition either for the formation of nitrates or for the storage of available nitrogen.

Owing to the fact that the ordinary rice lands in California are very sticky and puttylike when wet and bake and crack badly when dry, it is not possible to grow summer-cultivated crops successfully in rotation with rice. Wheat or barley grown in rotation with rice is not profitable with average yields at ordinary prices. The most common rotation in the California rice fields at present, therefore, is rice and fallow in alternate years. Good plowing in the fallow years helps to control certain aquatic weeds and gives the soil an opportunity to become thoroughly aerated during the summer months.

Fertilizer experiments conducted for a period of nine years at the Biggs Rice Field Station show that the rice crop responds very readily to certain nitrogenous fertilizers. Of these, ammonium sulphate has given the best results. The experiments show that the ammonium

sulphate should be applied just prior to the sowing of the rice. It is not necessary to work the fertilizer into the soil.

The application of from 100 to 150 pounds of ammonium sulphate per acre results in an average acre increase of from 500 to 600 pounds of rough rice. The cost of the fertilizer, plus the cost of application and additional expense of handling the increased yield range from about $7 for 100 pounds to $9 for 150 pounds of ammonium sulphate per acre. The increased yield is worth at average prices from $12 to $18 per acre, which yields a net profit of approximately 100 per cent on the fertilizer investment.

First Used in 1924

Ammonium suphate was first used on commercial rice fields in California in 1924. In that year 5 tons were used. In 1927 this fertilizer was used on approximately 3,600 acres, and the area thus fertilized undoubtedly will continue to increase as more growers come to appreciate the value of this product and as improved methods of applying it are developed and put into practice.

No satisfactory broadcasting machines are as yet available for applying ammonium sulphate. At present the end-gate broadcast seeders are used most commonly for this purpose. Much difficulty, however, is experienced in getting an even distribution of the fertilizer with these machines, because of the fact that too much of the fertilizer falls directly behind the wagon. As a result the rice often is uneven in growth and to some extent in maturity. The division of agricultural engineering of the College of Agriculture of the University of California has perfected a machine which, it is claimed, will broadcast ammonium sulphate quite uniformly when properly regulated.

JENKIN W. JONES.

ROSE from Portugal, the Belle Portugaise, Proves Adapted to U. S. From the botanic garden of Lisbon, Portugal, the Department of Agriculture introduced in 1911 six cuttings of a most beautiful rose that since has proved to be adapted to the milder parts of the United States and worthy of the attention of all lovers of roses in the Pacific coast and Southern States and bordering areas. It is known by the name under which it was introduced, the Belle Portugaise. While its exact parentage is uncertain it is known to be a hybrid of *Rosa gigantea*. It was first tested at the United States Plant Introduction Garden at Chico, Calif., where it proved entirely adapted. From Seattle south to the Mexican border on the Pacific coast it has become a favorite in rose collections, where it is considered one of the very finest of all the climbers. In the southern border, Gulf coast, and Atlantic Coast States this variety has not been tried extensively and therefore is less well known.

The Belle Portugaise is a sturdy vigorous grower with beautiful foliage. Plants 2 or 3 years old produce canes 8 to 10 feet in length and spread over trellises or porches in great profusion. In the first year the plant remains more or less of a bush; it expands as a climber only in the second year. While it is primarily a climber, it also does

well trained as a spreading bush. In full bloom this is a most attractive rose. The large handsome buds, borne in great abundance, expand into big flowers with delicate pink petals flushed with yellow at the base. (Fig. 201.) When grown in good soil with full sunlight and severely pruned, stems 24 to 30 inches long, bearing large, very attractive, well-formed buds are not unusual.

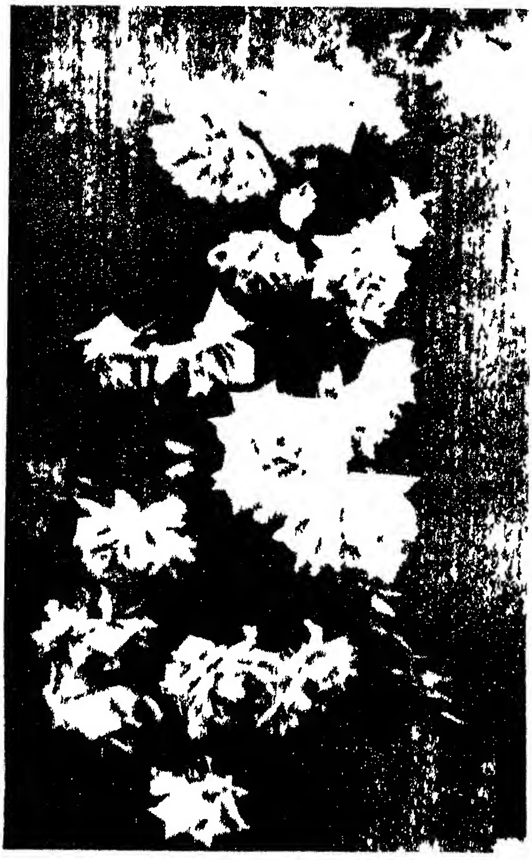

FIG. 201.—A flowering branch of the Belle Portugaise rose as it grows in southern California

In California, where this rose has been tested most extensively, it appears to be quite at home and has attracted the attention of garden club members as well as rose specialists. Growers have commented especially on its vigor, freedom from mildew, free-blooming qualities, and the beauty of the flowers.

While this rose has done well on its own roots, it also has proved entirely congenial to Manetti and *Rosa odorata* as stocks. It also roots from cuttings, from either half-ripened or hardwood, and is easy to propagate.

The excellent qualities of this rose commend it to rose breeders as a possible parent for new roses and as a variety worthy of a place in the rose garden wherever it is adapted.

C. C. THOMAS.

ROTATION and Tillage Supremely Important in the Great Plains Probably there is no other region in the United States where crop rotations and tillage methods are of greater importance than in the Great Plains. The fact that the number of staple crops that can be profitably grown in any section of the Great Plains is somewhat restricted, by climatic and marketing conditions, increases rather than decreases the necessity for a proper rotation of crops, and the annual distribution of the limited rainfall necessitates careful consideration of tillage methods calculated to conserve moisture by reducing weed growth as far as possible.

The selection of the crops to be grown in any given locality, the sequence in which they are to be grown, and the relative quantities of each crop grown must be carefully planned in advance for a long series of years. Tillage methods, on the other hand, must be planned from day to day to meet the ever-changing combinations of soil and climatic conditions, the reduction and the distribution of labor, the arresting of soil blowing and weed growth, and the conservation of precipitation.

Field investigations conducted by the Office of Dry Land Agriculture in the Bureau of Plant Industry at 10 field stations located in the western portions of North Dakota, South Dakota, and Nebraska, and in the eastern portions of Montana and Wyoming during the last 20 years have demonstrated that corn, spring wheat, and oats are the crops best adapted to the northern Great Plains, and that the wheat should be sown on the unplowed disked stubble of the corn crop which precedes it in the rotation.

Root Zones Go Deep

As above stated, the problems involved in tillage methods, or, in other words, the preparation of the seed bed, can not be treated in any such general way as can the selection and the sequence of the crops to be grown in rotation. But as it is known that the root zones of nearly all agricultural plants grown in the Great Plains extend far deeper than the deepest plowing, and that a good seed bed from 4 to 6 inches in depth will produce just as good crops as one twice that depth, we need no longer waste time, energy and money in subsoiling or in deep plowing. It is also known that a dust mulch serves no useful purpose, but is to be avoided, as it blows when dry and puddles when wet, and thereby retards penetration and increases run-off of surface water. It has also been demonstrated that, in the preparation of the seed bed, the time and the method of tillage and the choice of the implements used are both dependent almost entirely upon the physical condition of the soil, the suppression of weed growth, and the economical distribution of labor. The substitution of the duck-foot cultivator and other implements of similar type, or of the disk type, for the plow will often be found advantageous, by reducing cost and improving seed-bed conditions.

In view of these facts, each individual farmer should feel free to prepare his seed bed by such means as are warranted by the combination of circumstances and conditions at that particular time and place. There is no necessity for deep plowing or intensive surface tillage. The time of plowing, whether in early or late fall or in spring, should be determined by conditions of weed growth, the physical condition of the soil, and the economical distribution of labor, rather than by some predetermined schedule.

Experience the Ultimate Guide

Every good farmer knows, or he must learn from experience and observation, what constitutes a good seed bed for each crop and each soil with which he has to deal. He can not be taught by precept. Knowing the soil condition required for a good seed bed, he should

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spare no effort in bringing about that condition, by using such implements, in such ways and at such time, as seems necessary. Good farming is as essential to success in the Great Plains as elsewhere. Good farming means practicing the best methods of producing the largest crops at the lowest cost and leaving the soil in the best condition for the crop that is to follow.

Probably the greatest advantage to be gained by the adoption of the general type of crop rotation briefly outlined above is that it necessitates the growing of sufficient livestock to consume the corn crop, both grain and fodder. It also requires a systematic organization of the farm enterprise and provides for a fairly even distribution of the labor of the farmer, his family, and his hired help throughout the year. It also encourages the preservation of the American farm home, which has been such an important factor in American civilization.

E. C. CHILCOTT.

RUBBER Possibilities of Many Kinds Exist in the United States

It is probable that no previous event in the history of the world was able to change so rapidly the conditions and activities of so many people as the invention and utilization of rubber-tired vehicles in the United States. This remarkable development has placed our industries and our daily life on a special basis. The other countries of the world have scarcely begun to use automobiles to such an extent as has the United States. Of a total of about 28,000,000 motor vehicles now in use in the world, 22,000,000 are in the United States and 6,000,000 are widely scattered in other countries, the only other country having more than 1,000,000 being Great Britain.

With a practical need of rubber twenty times as great as that of any other country, we are entirely dependent upon imported raw material from a remote center of production in the East Indies. It is imperative to correct this deficiency if possible, so as not to be dependent entirely on foreign sources of supply. Our dependence on foreign rubber would place us in a critical condition if supplies were restricted or interrupted, as might be the case in the event of war.

Rubber Can Be Grown in the United States

The rubber deficiency need not be permanent, since rubber is a plant product, and many plants that produce rubber can be grown in the United States. Even the Hevea or Para rubber tree of South America, the same species that is cultivated in the East Indies, is not entirely excluded from the United States. One small Hevea tree has survived for more than 20 years in the open air in southern Florida, in an unfavorable location. But even if the Hevea or other trees grew well, the outlook for plantations like those of the East Indies would not be assured, since the tapping operation, for drawing the rubber "milk" from the bark, probably would be too expensive when performed by high-priced labor.

Mechanical and chemical methods of extracting the rubber probably must be used if the production of rubber is to become a practical possibility in the United States. Shrubs or smaller plants may be better than trees for extracting rubber in other ways than by tapping.

A mechanical process has been developed and applied successfully to the extraction of rubber from the guayule shrub, a desert plant which grows wild in northern Mexico and along the Mexican border in the Big Bend district of Texas. Also practical methods of cultivating the guayule plant have been developed through a series of experiments conducted by a private company for nearly 20 years in California and Arizona

Many Trees Contain Rubber

In addition to guayule, there are hundreds of other species of trees, shrubs, vines, and smaller herbaceous plants that contain rubber, many of which are known already to grow under our conditions, though only a small proportion of the eligible species have been tested. Some are tropical plants that probably would be confined to southern Florida, while others are natives of dry regions like the Southwestern States.

FIG 202 Experiments with desert milkweed at United States Acclimatization Garden, Bard, Calif Most of the plants are *Asclepias subulata*, the awl-stemmed milkweed, which grows much like a grass crop and could be harvested in the same way

The Assam rubber tree (*Ficus elastica*), a native of northern India, is well known in household cultivation in the form of cuttings known as "rubber plants." It is planted as a shade tree and grows to large size in the coast districts of California and in southern Florida as far north as Bradenton and Fort Pierce. The mature trees produce rubber of good quality, but not so readily obtainable by tapping as from Hevea.

Two species of Madagascar rubber vines (*Cryptostegia grandiflora* and *C. madagascariensis*) are being planted in many localities in Florida as ornamentals because of their handsome foliage and flowers. The first species is a large climber, while the second takes the form of a broad, rounded bush 5 or 6 feet high. These rubber vines grow rapidly and are very resistant to drought, so that they could be produced in large quantities, both in southern Florida and in California, possibly also in southern Texas. The Cryptostegia rubber is of good quality, though strains with a larger content of rubber are being sought.

Experiments in Desert Areas

Experiments are also being made with native rubber-bearing plants of the hot desert districts of southern California and Arizona.

FIG. 203.—Rubber experiments in southern Florida at the United States Plant Introduction Garden, Chapman Field south of Miami. At the left bushes with flowers (*Cryptostegia madagascariensis*), tall saplings of (*Manihot glaziovii*), a row of guayule (*Parthenium argentatum*) 2 years old, three rows of desert milkweed (*Asclepias subulata*), and several rows of guayule 1 year old. The guayule died after the hurricane of 1926

The most promising species is one of the desert milkweeds (*Asclepias subulata*, fig. 202), with tapering slender stems growing in clumps like a large bunch grass. Methods of cultivating this plant are being worked out, and it could be grown in large quantities in the

FIG. 204.—A rubber vine in Florida, *Cryptostegia grandiflora*, arching a broad gateway near Coconut Grove

desert districts if processes of extracting and utilizing the rubber were developed. Such experiments are being conducted at field stations of the Department of Agriculture in Florida, California,

and Arizona and include many other plants that may be suited to those regions. (Figs. 203 and 204.)

Many hardy temperate-region plants also contain rubber and might be grown over a large part of the United States, if the quantity and quality of rubber were sufficient and practicable methods of extraction were developed. One of the hardy forms is a tree from the northwestern Provinces of China that ripens seeds at Washington and grows as far north as Massachusetts. The rubber material of this tree (Eucommia) is formed in the leaves and the seed coats as well as in the twigs and bark. The gum does not flow from cuts in the form of latex, but is in separate small particles embedded in the tissues, showing fine elastic threads when the leaves or seed envelopes are broken and pulled apart. The material has high tensile strength like gutta-percha and is very durable. It is but little affected by heat.

O. F. Cook.

SAFFLOWER, an Oilseed Crop, is Adapted to Northern Great Plains

Safflower (*Carthamus tinctorius* L., fig. 205) has been cultivated in India and Egypt for many years as an oilseed crop. The oil possesses drying properties and the oil cake is valued as a stock feed. In the manufacture of paints, varnishes, oilcloth, linoleum, and allied products large quantities of drying oils are required. In the United States at the present time the principal drying oil used in these industries is linseed oil, derived from flaxseed, of which barely one-half the quantity required has been produced in this country in recent years, the remainder being imported from Argentina. There is some indication that safflower could well be introduced into our agriculture as an oilseed crop to furnish an additional source of drying oils.

Fig. 205—Flowering top of a safflower plant (*Carthamus tinctorius*)

Experiments in growing this crop have been carried on in the small-grain belt of the Northwest over a period of three years, and it is now being cultivated in plots of 2 to 10 acres in various sections of Minnesota, North Dakota, South Dakota, and Montana. The results show that it is

well adapted to the agricultural conditions of that section, both as regards dry-land and irrigation farming, and that it may be grown in the same manner and handled with the same farm machinery as are now employed for other small-grain crops.

Cultural Conditions

Safflower is especially suited to sandy or clay loam soil, but light sandy soil or heavy clay soil is undesirable. The plant requires about the same quantity of moisture as flax, and apparently it is more resistant to frost. During the three seasons in which the crop has been grown in that region no diseases have been observed.

The seed is sown from May 1 to May 15 by means of a graindrill. Approximately 100 days are required for the plant to mature, at which time it attains a height of 24 to 30 inches. Harvesting is accomplished by means of a self-binder (fig. 206), and threshing by the

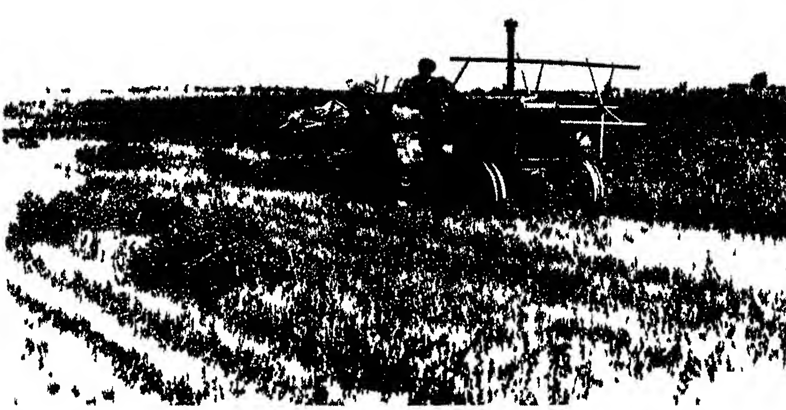


FIG. 206.—Harvesting safflower in northeastern South Dakota

usual grain separator fitted with wheat or barley sieves. The seed is white or pale cream colored and in appearance somewhat resembles small sunflower seed.

Yield of Seed and Oil

From the results obtained to date it appears that with a normal season and average rainfall a good average stand of safflower will yield from 25 to 30 bushels of seed to the acre. Under irrigation, where the moisture supply can be controlled, yields of 50 to 60 bushels per acre are indicated. A good quality of seed weighs about 45 pounds per bushel and yields from 24 to 27 per cent of oil.

The oil can be extracted from the seed by means of the machinery and methods usually employed in obtaining linseed oil. In order, however, to procure the maximum yield of oil and to obtain a satisfactory press cake, it is essential that the seed be decorticated or hulled

before crushing. This can be readily and cheaply accomplished by machinery similar to that used for hulling cottonseed.

Tests made in the laboratory and in manufacturing plants indicate that safflower-seed oil is a valuable raw material for use in the paint and varnish industries. The press cake is simialr in composition to that from flaxseed and should be of equal value as a stock feed.

As a farm crop safflower requires no change in either methods or machinery now in use for the production of the small-grain crops, and if established it will furnish an additional domestic source of a drying oil that will supplement the linseed oil now in use, of which the quantity produced in this country is insufficient to meet the demands of the industries mentioned.

FRANK RABAK.

SCIENCE and Quackery Frequently Confused by Uncritical Public We are living in an age of rampant scientific experiment, an age in which isolated facts regarding such experiments are broadcasted to the public by a multitude of very expensive agencies. But does the public always tune in properly and get the correct scientific wave length? Are their receiving sets good? It is exceedingly doubtful.

For some strangely ignored reason too many individuals still remain in a mental state wherein they fail to differentiate between the scientist and the sciolist. When a popular item from the United States Department of Agriculture, embodying true scientific data, stands in the press beside the pseudoscientific dicta of some quack or the subjective speculations of some mystical charlatan, people too often evaluate these two items as of equal validity and usefulness. While we spend millions to promote scientific investigation and to spread its results abroad, it is complained constantly that people do not stick to science in their practical affairs but pursue and enrich the quack as in earlier ages.

Why is this? Science is a small but gradually broadening body of knowledge which is exact, verifiable, demonstrable, and communicable. A brief but attentive consideration of these four adjectives would give anyone sufficient criteria of judgment with which to distinguish scientific fact from sciosophy or organized ignorance. Is the description of the facts exact? Can I myself verify these facts? Could I, with the same apparatus, etc., demonstrate those facts myself? Can the essence of the experiment be communicated to others so that they also can perform it and get the same results? If the answer is "Yes" in each case, we have to do with science.

But the public had not been taught (1) to use verifiable facts as criteria of judgment; (2) to see knowledge and science as a connected whole, embracing all known facts, and requiring a generalization to be consistent with the whole before it can take on validity; (3) to believe in principles—exact observation, precise description, cautious deduction, etc.—but to hold theories and hypotheses very tentatively.

The Significance of Isolated Facts

Facts are only little truths. Behind facts, and acting as their necessary background, stands the sturdy structure of scientific truth

as gradually enlarged by the scientific method or attitude. Any experimental fact, no matter how isolated and how apparently useless, is important, provided it was correctly observed and accurately described, for an experimental fact which to-day seems absolutely disconnected and without meaning may suddenly assume great significance and far-reaching importance to-morrow.

But there is grave danger in this experimental age of overrating the single experiments, the little facts, the isolated, disconnected data. By overspecialization we tend constantly to ignore or to forget the correlations and universal coordinations which can alone make facts valuable. Intellectual interpretation must fit these facts into the whole synthetic body of organized science to make them practically useful. This means that we must have a philosophy of science, a true scientific metaphysics (using the word only to mean a science of first principles) as a conventional postulate upon which to found future knowledge attainment.

No matter how efficient such agencies as the United States Department of Agriculture are in the accumulation and dissemination of scientific facts their efforts are to-day greatly limited by an uncritical attitude on the part of the public. This springs from a fault in our educational system which obviously does not sufficiently emphasize exact observation, precise description, and accurate logical deduction. We need popular writers and speakers to show adults how to appreciate science, to give them a vision of the scientific attitude, to enable them intelligently to absorb the information which they now so largely ignore, or so inefficiently assimilate and integrate into life.

Facts as Criteria of Judgment

To-day when some mystic declares that he hooks onto infinite sources of power with his medulla oblongata and revivifies himself by thus "scientifically" increasing the motion of his organic molecules, the public sees little incongruity in associating this statement with truly scientific statements regarding ultra-violet rays or interatomic energy. Yet the latter statements are exact, verifiable, demonstrable, and communicable, while the former are hazy, unverifiable, undemonstrable, and can not be communicated generally so that others can go and do likewise. People generally need to adopt scientific facts as criteria of judgment in practical matters.

It is a question whether we do not err when we spend so extravagantly upon experimental research and the broadcasting of its results and so completely ignore faulty conditions at the receiving end. We may broadcast isolated scientific facts forever and do so impotently and uselessly unless the public can integrate and utilize these facts, recognizing them as tiny parts of a great, coherent, consistent, coordinated whole. NAA at Arlington, Va., would be utterly useless if all the receiving sets in the United States of America were so imperfect that they brought in only distorted static and verbal nonsense. The possibility of expending some money and effort upon the mechanism of critical public receptivity to scientific data is thrown out, therefore, as a suggestion which, it is hoped, may stimulate thought and activity along this line.

T. Swann Harding.

SEED Origin Attested in New Government Verification Service The United States seed-verification service was inaugurated in October, 1927, by the Bureau of Agricultural Economics to give the buyer of certain kinds of seed, bearing a verified-origin seed certificate, issued under authority of the Department of Agriculture, the proper assurance that the seed purchased by him was produced where stated in the certificate. All dealers enrolled in this service, known as verified-origin seed dealers, agree to keep prescribed stock records and samples which, together with their stocks, are subject to the inspection of seed inspectors of this bureau. Furthermore, these dealers are required to make applications for inspection certificates covering all lots which are to be verified, to submit weekly reports covering new lots of verified-origin seed prepared or offered for sale, and to comply with the rules and regulations of the service. Sixty-three dealers in 24 States, scattered from the Atlantic to the Pacific and from Minnesota to Texas, have enrolled for the first season (ending June 30, 1928).

This service is concerned only with origin of seed (locality of production) and not with variety, purity, germination, quality, grade, etc. The origin of every lot of seed covered by a verified-origin seed certificate may, through an examination by a Federal seed inspector of the records and samples of the verified-origin dealer offering such seed, be traced back to the place where the seed was produced. Furthermore, these records will show what disposition is made of every pound of the kinds of seed which are being verified.

Verification Limited at Present

Verification during the first season of the operation of this service is to be limited to alfalfa, clovers, and seed corn. The plan of the service lends itself to verification of all kinds of seed—field, vegetable, or flower—but it is not contemplated that the service will be extended, in the near future at least, to other than field seeds.

The seed-verification service is purely a voluntary one and there are no penalties other than the withdrawal of the privileges accorded dealers enrolled in it. Each verified-origin seed dealer understands, however, that if improper, unethical, deceptive, fraudulent, illegal, or unauthorized use is made in his advertising or by other method of an inspection certificate or of a verified-origin seed certificate or of the service itself, he may be denied further benefits or use of this service

The starting point in the evidence supporting the statement of origin is the grower's or shipper's declaration, or an official State certificate of origin. With declarations at hand covering the various lots of seed for which verification is desired, the verified-origin dealer makes application to the nearest inspector for an inspection certificate. This certificate is, in effect, a transcript of the dealer's own record which may be examined at any time by a seed inpector. It entitles the verified-origin dealer to issue verified-origin seed certificates for all lots covered by it.

The verified-origin seed certificate is the recognized commercial document verifying the origin and identity of the seed which it covers. This certificate may be used in either of two forms; namely,

as a tag certificate attached to a bag or other container, or as an invoice certificate mailed with shipping documents. An emblem in the form of a shield with the words "Verified-Origin Seed" superimposed upon the letters "U S" has been adopted for use by verified-origin dealers in letterheads, tags, circulars, catalogs, newspaper advertising, etc.

Fees Designed to Cover Costs

This service is conducted by virtue of the authority vested in the Secretary of Agriculture by the appropriation act for that department, to establish an inspection service for perishable products. This act, among other things, provides for fees that are reasonable and that cover as nearly as possible the cost of the service. Accordingly, for seed listed in an inspection certificate a fee of 3 cents per 100 pounds or 5 cents per bag is charged. The fee for a particular lot is payable only once, no matter through how many hands the lot may pass before reaching the ultimate consumer.

Applications for enrollment in the service for each year ending June 30 will be considered between July 1 and September 1 of the preceding year. Hence, applications for 1929 (that is, the season of 1928–29) will be considered July 1 to September 1, 1928.

The seed-verification service is in part a voluntary agreement entered into between the department and qualified dealers who agree to comply with its provisions, rules, and regulations in return for the privilege of issuing verified-origin seed certificates and of enjoying the benefits to be derived therefrom. The success of the service will depend to a considerable extent upon the whole-hearted cooperation of these dealers. The department shares with them the responsibility for making a verified-origin seed certificate in effect a guarantee that the origin of the seed is as stated. The service is to be supervised closely so that everyone can feel confident that its provisions are being complied with fully. Inspectors for this service are located at Washington, D. C., Chicago, Minneapolis, Kansas City, Salt Lake City, and San Francisco.

G. C. Edler.

SHADE-TREE Value is Subject to Severe Reduction by Insects Shade trees and ornamental shrubs represent a class of values often overlooked but which is becoming greater and commanding more attention year by year. This esthetic value is frequently entirely out of proportion to the commercial value. The tree as lumber may be worth a few dollars, but as a shade tree it is usually worth considerably more. The memories that are linked with it may make it precious to the owner. Its shape, location, or size, or the years required to grow another may make it almost irreplaceable.

These inestimable values, however, are subject to severe reduction through the attacks of insects. The loss may come either through the death of the tree or through the marring of its form and thinning of its leaves. The demand for information leading to the prevention, reduction, or elimination of such losses has increased greatly within recent years.

There is considerable variety in the nature of the insect attacks responsible for these losses. Bark borers, wood borers, sucking insects, and defoliators are the more important groups of insects that infest and injure shade trees.

Bark borers are almost always beetles or beetle grubs. They work in the inner bark or living tissue (fig. 207) and frequently girdle the tree in this important layer and kill it. Pine, spruce, hickory, birch, and oak are peculiarly subject to injury by these insects. Wood borers (fig. 208) are also usually beetle grubs and their galleries frequently commence under the bark. The wood borers seldom,

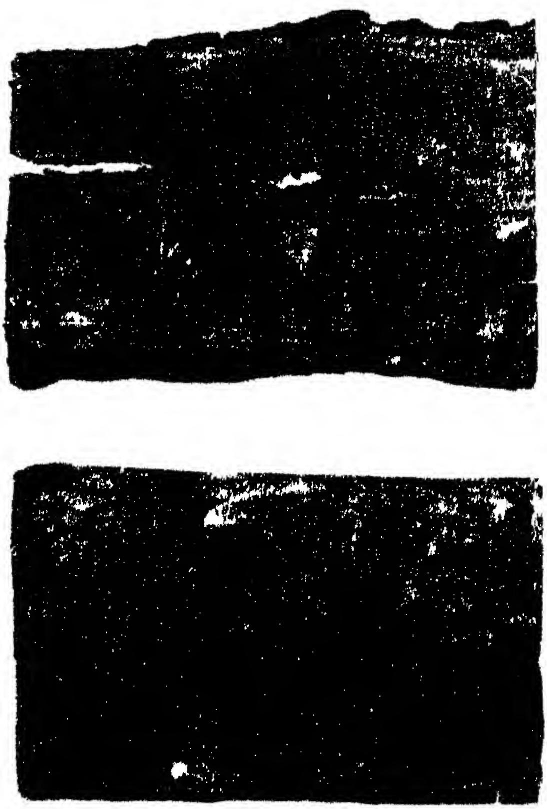


FIG. 207.—Work of the hickory bark beetle showing the galleries on the bark and on the wood. Natural size

however, kill trees outright but usually do their harm through weakening the supporting tissue of the tree and leaving channels for the entrance of ants (fig. 209) and the organisms of decay.

A great many of the tree borers are classed as primary enemies of trees because they attack healthy, vigorous, and uninjured trees. Many of the bark borers and some of the wood borers belong in this group. Other borers are classed as secondary enemies of trees because they attack weakened, sickly, or injured trees. Most wood borers are of this latter type.

The Sucking Insects

Scale insects injure trees by sucking juices from the leaves or through the bark. They may kill the trees, or the parts of the trees attacked, but in this case death is slow, extending over several years. The scale insects infesting coniferous trees are found usually on the needles or leaves; those on deciduous trees are found on both the leaves and bark of the branches and trunk. (Fig. 210.)

FIG 208 —The galleries and grub of the elm borer Natural size

Aphids, like scale insects, feed by sucking juices from the leaves (fig. 211) and the young tender shoots of trees and other plants. They seldom, if ever, kill the plant even when abundant but may cause the paling or early falling of the foliage. Both scale insects and aphids may become very annoying through the excretion of honeydew, which often coats the upper surfaces of the leaves. (Fig. 212.) It is sweet and sticky, and on badly infested trees drops to the ground, soiling everything under the trees with which it comes in contact. It is hard to remove, turns blackish with mold, and attracts great numbers of insect guests.

Defoliators (fig. 213) eat the leaves of the trees. Caterpillars, sawfly larvae, beetle grubs, and beetles are the chief offenders. When the trees defoliated are evergreens the injury may be severe, sometimes even killing the entire plant. On deciduous trees, however, injury by defoliators is not so serious unless the trees are completely stripped year after year.

FIG. 209.—Section of a tree trunk showing the work of ants. One-half natural size

Preventing the Loss

There are several ways of preventing or combating insect injuries to shade trees and ornamental shrubs. The high value of the trees makes it possible to apply corrective measures which would be impractical in forests or even in orchards. In most cases a vigorous, healthy condition of the tree is the best possible protection against injury. Proper planting, pruning, fertilizing, and watering, and

FIG 210 —A maple twig infested by the cottony maple scale One-half natural size

FIG 211 —Maple leaves infested by the woolly maple alder blight aphid Natural size

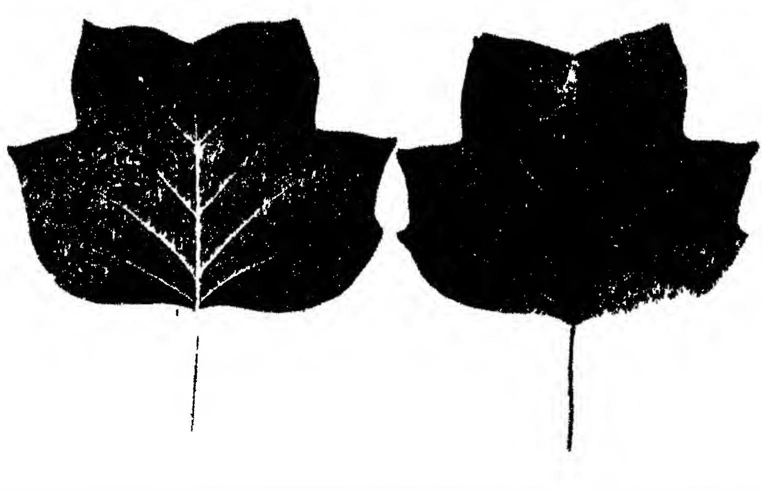


FIG 212 —Small aphids on the under side of a tulip poplar leaf, and honeydew spots on the upper surface of a leaf Natural size

the proper care of wounds will do much to preserve the strength and beauty of the trees and aid in avoiding insect attack or serious consequences from such attack. The removal and destruction of dead trees, or heavily infested trees that can be spared, or parts of trees, will eliminate many breeding places of injurious species of insects. The introduction and encouragement of the natural enemies, such as the insect parasites and predators, of the tree pests is a third potent factor in the prevention and control of injurious species. Finally, the use of the proper spray or other artificial means of combating the insects present is often very effective.

Lead arsenate has proven a very effective spray for leaf-eating insects when used in the proportion of 1 pound of powdered lead arsenate to 50 gallons of water. This solution is sprayed on the foliage, and the leaf eaters are poisoned by it while feeding.

Scale insects are best combated by oil-emulsion or miscible-oil sprays. These sprays, which kill by contact with the insects rather than by poisoning their food, should be applied during the dormant period of the trees in the fall or early spring. Proprietary preparations of these oil sprays can be purchased, and they should be used according to the directions of the manufacturer. Thorough spraying of the infested parts is essential, and yet care should be taken to see that the spray solution does not accumulate on the ground at the base of the trees where it might injure the roots.

FIG. 213.—An arborvitae twig showing three cocoons of the bagworm (a defoliating caterpillar which incloses itself in a sack of spun silk and plant fragments). Note how difficult it is to distinguish the bags. Natural size.

Aphids are usually controlled by contact sprays of nicotine sulphate and soap. The commercial concentrated nicotine preparations contain usually not less than 40 per cent of nicotine and may be used in the proportion of 1 fluid ounce of the nicotine preparation to 8 gallons of water in which a pound of common laundry soap has been dissolved. Several sprayings at intervals of about a week are desirable, and bright warm days appear to increase the effectiveness of the solution, which should be applied so that the spray mist will reach the bodies of the aphids.

WILLIAM MIDDLETON.

SHEEP Crate Should Protect as Well as Confine the Animal A livestock shipping crate is built not only to confine but also to protect the animal during transit Durability is desirable, so that the same crate may be used over and over Lightness in weight is highly important to keep down transportation charges.

Figure 214 shows a sheep crate designed by the Forest Products Laboratory, in cooperation with the University of Wisconsin and the Wisconsin Livestock Breeders' Association, to meet these requirements. In this crate the side and end slats near the bottom are nailed close together to prevent leg injury. The end gate makes loading and unloading easy and makes it unnecessary to knock off and renail the end slats. To give the animal proper support, the floor boards are nailed crosswise on top of the skids Diagonal braces prolong the life of the crate by helping to resist severe skewing

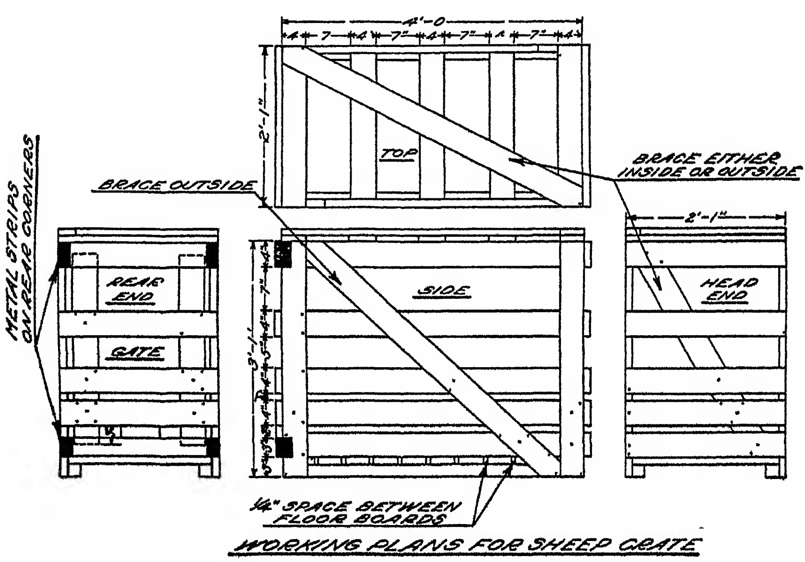


FIG 214 —Working plans for sheep crate

forces which otherwise would soon loosen the nails. In a crate to be used but once the diagonal braces may be omitted and slats used instead of an end gate.

Practically any of the species of wood available at a lumber yard will make a good crate, but the lighter-weight species are recommended. The lumber should be quite dry. Although nominal 1-inch lumber (actual thickness twenty-five thirty-seconds of an inch) is shown in the illustration, slightly thinner lumber if available would make a lighter crate, strong enough for shipping sheep. Seven-penny nails may be used for nominal 1-inch lumber, but thinner lumber requires smaller nails and closer nail spacing.

The floor should be made first, by nailing the 25-inch lengths of board crosswise on the 2 by 2 inch by 4-foot skids. The sides should be made separately, with nails driven from the inside and clinched outside. Each side requires two uprights 3 feet 1 inch long, five slats

4 feet long and one diagonal 5 feet long. After attaching the sides by nailing the uprights and braces to the skids, put on the top, consisting of two cross pieces 2 feet 1 inch long, three cross pieces 1 foot 11 inches long, and one diagonal 4 feet 6 inches long. Now complete the ends with one slat 3 inches wide and 2 feet 1 inch long (bottom slat at rear end), six slats 4 inches wide and 2 feet 1 inch long, and one diagonal 3 feet 8 inches long. Lastly build the end gate, which is made from two uprights 2 feet 6 inches long, three slats 2 feet 1 inch long, and one spacing block 1 by 2 by 6 inches.

Crate Should be Kept Clean

The useful life of a crate will be greatly increased by keeping it clean and storing it off the ground under shelter when not in use.

A crate of the size shown is intended for an average sheep For a buck crate the recommended inside dimensions are 4 feet 5 inches in length, 2 feet 1 inch in width, and 3 feet 2 inches in height. A lamb crate should be about 3 feet 4 inches long, 1 foot 5 inches wide, and 2 feet 6 inches high.

For convenience in buying and cutting the lumber, two bills of material are given below. Short lengths, as shown in the first bill, are to be preferred because they can often be bought more cheaply than long-length material of the same grade.

Lumber Required for Sheep Crate and Directions for Cutting

One 1 by 4 inches by 10 feet: Cut into two pieces 3 feet 1 inch and two 1 foot 11 inches.

One 1 by 4 inches by 8 feet: Cut into one piece 4 feet and one 3 feet 1 inch.

Six 1 by 4 inches by 4 feet: No cutting necessary.

Three 1 by 4 inches by 6 feet. Cut each into one piece 4 feet and one 1 foot 11 inches.

Two 1 by 4 inches by 8 feet: Cut each into one piece 5 feet and one 2 feet 6 inches.

One 1 by 4 inches by 8 feet: Cut into two pieces 2 feet 1 inch (rip one to 3-inch width for bottom slat, rear end); one 3 feet 8 inches.

One 1 by 4 inches by 8 feet: Cut into one piece 4 feet 6 inches and one 3 feet 1 inch.

Ten 1 by 4 inches by 4 feet: Cut each into one piece 2 feet 1 inch and one 1 foot 11 inches.

One 2 by 2 inches by 8 feet: Cut into two pieces 4 feet (or make skids by ripping one 2 by 4 inches by 4 feet).

The following long lengths will cut to good advantage and may be used if the short lengths listed above are not available:

One 1 by 4 inches by 12 feet: Cut into three pieces 1 foot 11 inches and three 2 feet 1 inch.

Three 1 by 4 inches by 12 feet: Cut each into three pieces 4 feet.

One 1 by 4 inches by 14 feet: Cut into two pieces 2 feet 6 inches, one 4 feet 6 inches, and two 2 feet 1 inch.

One 1 by 4 inches by 14 feet: Cut into two pieces 5 feet and one 4 feet.

One 1 by 4 inches by 14 feet: Cut into six pieces 2 feet 1 inch.

One 1 by 4 inches by 16 feet: Cut into four pieces 3 feet 1 inch and one 3 feet 8 inches.

One 1 by 6 inches by 18 feet: Cut into eight pieces 1 foot 11 inches (for floor); one 2 feet 1 inch and rip to 3 inches (for botton slat, rear end).

One 2 by 2 inches by 8 feet: Cut into two pieces 4 feet (or make skids by ripping one 2 by 4 inches by 4 feet).

T. A. Carlson.

SHEEP Improvement Demonstrated by U. S. Southdowns The foundation stock for the flock of purebred Southdown sheep, owned by the department at Sheep Acres, Beltsville, Md., was selected in November, 1909, from the Huntleywood flock of Beaconfield, Canada. Sheep Acres is a part of the United States Animal Husbandry Experiment Farm. At the time the sheep were purchased the Huntleywood flock was owned by George Drummond, who had made extensive importations of sheep from England, principally from the famous Babraham flock of C. R. W. Adeane and the Sandringham flock of the King. It was considered at that time one of the best flocks in America. The selection consisted of 29 yearling ewes and a yearling ram, Babraham Hercules, 23701.

This ram, as well as the ewes, was carefully selected from a large number and the entire lot consisted of individuals of outstanding merit. While there was but little apparent difference in the individual excellence of the ewes purchased, they differed so greatly in their ability to transmit desired characteristics in their offspring that careful selection of the stock for breeding during the last 20 years has eliminated the offspring of all but 10 of the original 29 ewes. Of the 49 ewes now in the breeding flock, 37, or 76 per cent, trace directly on their maternal side to 5 of these 10 ewes.

All the purebred Southdowns were kept at the United States Morgan Horse Farm, Middlebury, Vt , until November, 1915, when 43 ewe lambs were shipped to the United States Animal Husbandry Experiment Farm, Beltsville, Md. These ewes were culled rigidly in 1916 as yearlings and were the nucleus of the flock at that farm. Additional ewes were added from the Middlebury flock in 1918 and all the remaining Southdowns were shipped to Beltsville from Middlebury in 1920 to make room for a flock of experimental grade ewes.

Choice Ewe Lambs Replenish Flock

In 1920 the Southdown flock at Beltsville consisted of 120 breeding ewes, but it has been reduced to about 50 ewes at present in order that experimental flocks of the Shropshire, Hampshire, and Corriedale breeds could be kept. Since the purchase of the original Drummond ewes no new ewes have been added to the flock The flock has been kept replenished by the best ewe lambs produced, about one-fourth of the ewes in the flock being replaced each year by yearlings.

Only the best rams obtainable have been used as sires and every effort has been made to maintain and improve the excellence of the flock. The original ram, Babraham Hercules, proved to be an exceptional breeder. The next ram used to any considerable extent was Cheveley Parallel 31528, a ram shown at the Royal in England and one of a pen of three that took first premium at that show. Two sons of this ram, U. S. D A. 222, 34064, and U. S. D. A. 276, 35293, were also used extensively in the flock These two rams were followed by the ram Gatton Park, W–84 (fig. 215), bred by Jeremiah Colman and shown at the English Royal in 1921, where he was in the first pen of three yearling rams. This ram was imported that fall by Glimmerglen Farms, of Cooperstown, N. Y., from which he was obtained by the department.

This ram was first used in the fall of 1922 and has been used extensively every year since until the fall of 1927. He has been a wonder-

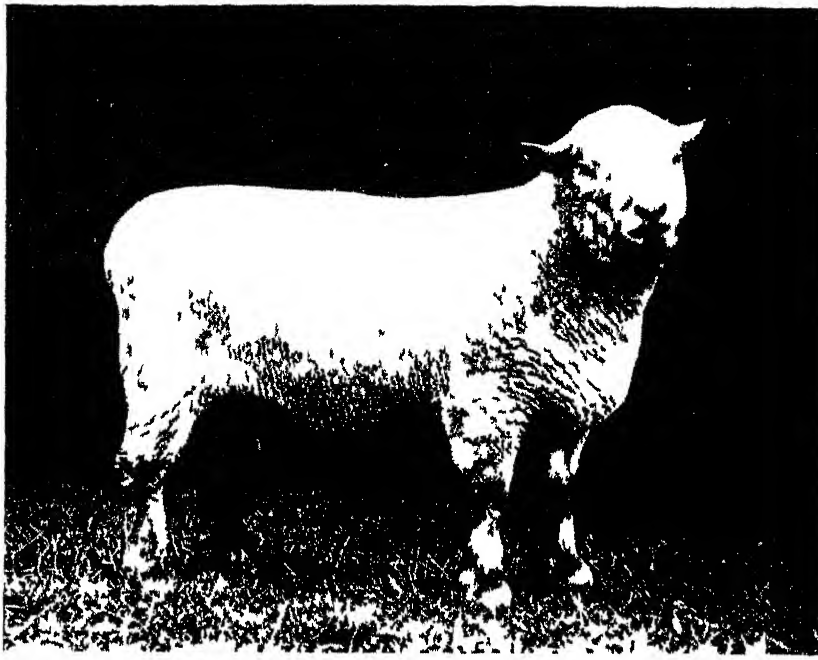


FIG. 215.—Southdown ram in use at the United States Animal Husbandry Experiment Farm, Beltsville, Md., and sire of most of the ewes now in the flock. (Photograph taken soon after shearing.)

FIG. 216.—Purebred Southdown ewes on lawn at United States Animal Husbandry Experiment Farm, Beltsville, Md.

ful sire and most of the ewes now in the flock are either his daughters or his granddaughters. (Fig. 216.) Two sons of this ram have been used to a limited extent in the flock, with very good results and a yearling linebred son now in service will no doubt be extensively used in the future to carry on the blood of this magnificent sire.

Some Show-Ring Awards

While the department has never competed with breeders in the show ring, numerous animals bred in the flock have been shown with considerable success. Individual wethers, sold to private breeders, have been shown at the International Live Stock Exposition, Chicago, on five occasions. These five showings resulted in three grand championships and one other Southdown championship, while on only one occasion was the Government-bred wether defeated within the breed.

In 1923 a carload of purebred and grade Southdown lambs bred by the department was also made grand champion carload of lambs at the International Live Stock Exposition.

The flock at present is noted for the excellence of its individuals and extreme uniformity. The foregoing show records are given merely as an indication of the superior merit which has been established through years of careful selection and corrective matings on a basis of production of sire and dam rather than on the individual excellence of each parent.

C. G. Potts.

SHEEP Watering Permits Use of Dry Grazing Land There are large areas of grazing land in the western part of the United States that have not been fully used for grazing purposes owing to the lack of an adequate supply of surface water, such as running streams or other natural watering places for livestock. Much of this range is of the highest type, but has been used only to a slight extent by livestock, and that only during short periods when water was supplied by rain or snow. With the areas of the open ranges becoming smaller, the problem of developing natural water supplies and otherwise making water available on dry ranges is of more and more importance to the range livestock industry.

This problem is being studied at the United States Sheep Experiment Station at Dubois, Idaho. The station is well equipped to study the water requirements of range sheep on dry ranges. The station range includes about 28,000 acres of semiarid grazing land, which has a very limited supply of natural water. The annual precipitation on this range runs from 6 to 16 inches, with a mean of about 13 inches, most of which comes as snow during the winter and early spring. This range is of the sagebrush type, the forage cover consisting mainly of grass, with a few weeds and some short browse, but with no shade for the sheep. One well, 750 feet deep, has been provided at the station headquarters, together with a power pumping outfit, and underground concrete storage reservoirs. The water table is very low, making well drilling expensive. It is considered that water can be hauled to outlying points on the range at a lower cost than that of drilling additional wells.

Water Requirements of Sheep

Sheep will use snow (fig. 217) for water when it is available, and during cool periods in the spring when forage is succulent and there are occasional showers or heavy dews, sheep require very little water. Cool periods in the fall with heavy frosts also reduce their water requirements. But during dry, warm periods in the late spring and early fall when the forage is dry and beginning to cure, or is cured, water must be supplied daily. Under average conditions about 3 quarts to a gallon of water is required each day per ewe with lamb at side on green feed, while about the same amount is required for a dry ewe on dry feed in the fall. Under abnormally dry conditions when the sheep must travel over a long, dusty trail to water, as much as 1½ gallons of water may be required daily.

FIG. 217.—A band of sheep grazing toward the two snowdrifts in the background. Sheep will eat snow when water is not available.

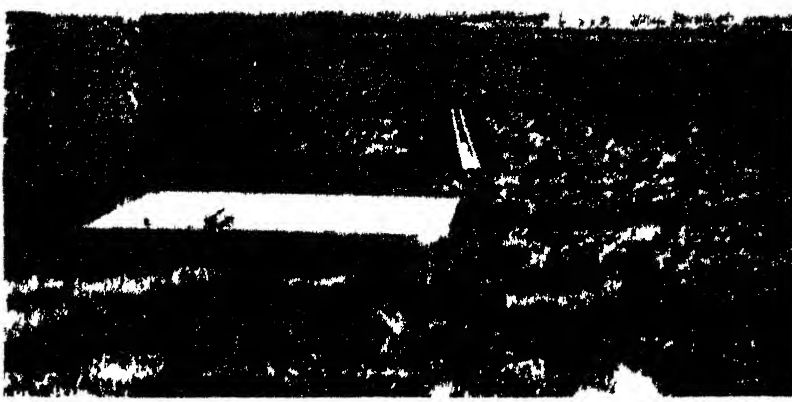
In order to water these sheep properly during dry periods, several permanent, outlying water stations have been constructed. Each station (fig. 218) consists of a 6,400-gallon, closed concrete reservoir and a concrete trough. These troughs are from 150 to 180 feet in length and they have capacities varying from 1,450 to 2,250 gallons each. The water stations are so situated that they can be filled from the hillsides during storms and when snows are melting in the spring. Roads have been cleared so that water can be hauled to them from the reservoirs at headquarters as required.

Tank Wagons Also Used

These permanent water stations are used mainly when the sheep are in large bands during prolonged dry periods. Water is provided at remote points on the range that can not be reached from the permanent water stations, by movable tanks and troughs, thus conserving the range near the permanent water stations. This practice also

affords full utilization of some of the more inaccessible areas and is helpful in that it avoids overgrazing the areas near the water stations. Ranges which are so rough as to be inaccessible to tank wagons are used during storms or when snow is available.

The conservation of flood waters and snowdrifts opens up areas to grazing which otherwise could not be utilized. Natural reservoirs have been constructed by throwing a rim of earth around a small natural basin which has a solid rock bottom. The useful period of snowdrifts can be prolonged by fencing them to eliminate trampling by the sheep, by covering the drift with a layer of straw 4 to 6 inches deep to retard melting, and by placing a trough below the drift to catch the snow water as it melts.



...manent concrete water station at the United States Sheep Experiment Station. Note condition of the forage near the water trough. Too often the range is overgrazed ...manent watering places

By developing the supply of natural surface water and carefully conserving it, and by providing artificial means of supplying water, when water is not otherwise available, many dry ranges can be successfully utilized by sheep.

W. A. Denecke.

Sheepmen Can Cut Lambing Losses by Good Sanitation

Sanitation is a highly important factor in sheep production, especially with regard to the prevention and control of disease. The effects of good and poor sanitation are readily seen in connection with early shed lambing as practiced in many parts of the range country and wherever sheep have been maintained on the same ground for a period of years.

When lambing sheds and corrals are new and on clean ground serious losses are unusual, but with the continued use of the sheds year after year the losses gradually increase until in many cases they become excessive. It is noteworthy also that heavy losses caused

by the infections may be sustained at times whether the sheds and corrals are new or old.

The use of reasonable, sanitary precautions, such as cleaning and disinfecting the sheds, cleaning and plowing corrals, and providing drainage, generally eliminates most of the danger. When proper drainage can not be provided it is best to move the sheds and corrals to clean, dry ground.

Use Clean Lambing Sheds

Temporary lambing sheds, built of light frame material and covered with canvas, are extensively used in sections where the snowfall is not excessive. These sheds are ideal from a sanitary standpoint, as the canvas is removed as soon as lambing is over, allowing full benefit from the sunshine to the interior of the shed during the entire summer, and if it becomes necessary they are easily moved.

The use of the lambing corrals by sheep or other classes of livestock during the remainder of the year increases the danger of infection. Building lambing sheds in connection with old corrals has often caused heavy losses of young lambs. During wet, stormy weather or when the ground is thawing out, various infections are especially liable to become prevalent.

Navel infection is probably the most common condition found in lambing sheds. The disease appears within a few days after birth and may be manifest in the form of joint ill. The joints of the legs become stiff and swollen and often contain pus, or, when necrosis infection is present, the liver becomes affected, exhibiting yellow, necrotic areas of varying sizes. In either case the lambs stop nursing, lie down most of the time, and usually die within a few days. Sore mouth of necrotic stomatitis will often develop under similar circumstances and may spread to the teats and udders of the ewes.

Ordinary sanitary measures will usually lessen the occurrence of navel infection and sore mouth in lambs and also help to control these diseases after they develop.

Lambs from Weak Ewes Contract White Scours Readily

Infectious diarrhea, or white scours, is another infectious disease of lambs associated with poor sanitation. It often occurs in lambing sheds connected with feed yards that have been used for fattening purposes. The infection is obtained from the soiled teats and udder of the ewe when the lamb first nurses and becomes more prevalent during wet, stormy weather. The disease usually develops within from 18 to 36 hours after birth and is generally fatal. Lambs from weak, undernourished ewes seem more susceptible to infectious diarrhea than those from strong, healthy animals, but where the sanitary conditions are unfavorable the disease may develop at any time, causing losses of 10 per cent or more, in many cases.

Septic metritis, or inflammation of the uterus, is an infectious disease affecting ewes soon after lambing, and is manifested by high fever, frequent straining, a vaginal discharge, and rapid prostration. It usually follows abortion or difficult parturition, but where sufficient sanitary precaution is not taken, the disease may spread, by contact with infected pens, to ewes that have lambed normally. Treatment

is seldom satisfactory, as the affected animals usually die. The most practicable means of control consists in the thorough cleaning and disinfection of the lambing sheds and the small pens in which the ewes are kept for the first three or four days after lambing, as well as all equipment used in handling ewes. Infected animals should be isolated, all carcasses destroyed, and a strict system of sanitation followed during the remainder of the lambing period.

Old Corrals Increase Losses from Tetanus

Tetanus (lockjaw) is becoming more prevalent in the range country, causing losses in lambs following docking and castration. Early lambs are usually docked before they are turned on the range, and when clean corrals are used infection rarely follows. Where ewes are lambed on the range it is generally customary to drive the bands to some centrally located corral for docking. There corrals are often used for shearing, branding, dipping, and for separating the ewes and lambs in the fall, and usually contain an accumulation of filth and manure from years of use. The use of these old corrals has caused considerable loss from tetanus at various times. Such places should be discarded in favor of temporary docking corrals built on clean ground.

The habit of sheep, like other classes of livestock, is to seek shade and seclusion during the middle of the day in summer to avoid the heat and flies. There is a fly (*Oestrus ovis*) which attacks sheep in summer, depositing its larvae on the edges of the animals' nostrils, from which point they migrate to the sinuses of the head, where they complete their development. Through instinct sheep will bunch up with their heads together and their noses near the ground whenever this fly is present. During dry weather this action results in the stirring up of considerable dust.

Ample Shade Desirable for Sheep

When sheep are on the range the ground is usually clean and the dust causes very little inconvenience, but when they are being maintained on ranches the favorite shade is often around old buildings and sheds in the barnyard where the dust consists principally of manure and is impregnated with various organisms capable of producing at least a local irritation of the respiratory tract. This condition accounts for a great deal of the catarrh and nasal discharge that are common in ranch sheep, and in some cases has resulted in considerable loss from mechanical pneumonia. The results are usually worse where there is insufficient shade to accommodate all the sheep, as those on the outside will continually crowd to get in, and in this way keep the entire band in commotion. Young, well-fed rams are subject to this condition, as some are always ready to start a fight when ever they bunch up.

Losses from this source can be avoided by providing shade on clean ground devoid of dust, or, when old corrals and sheds must be used they should be kept as clean as possible. Bedding the shading places with clean straw is a cheap and effective way of keeping the dust down, but it should be changed occasionally as it becomes contaminated.

Sheep, although not subject to many of the general, infectious diseases of animals, are susceptible to local infections, and much trouble can be avoided by following a reasonable system of sanitation in their management and control.

W. T. HUFFMAN.

SIZE of Farms Is an Important Factor in Standards of Living Unless a business is a failure, it is evident that the larger the business the greater the returns, other things being equal. There are variations from farm to farm in one or another of those factors which go to make up a farm business, and no two farms are alike in every respect. But in spite of this the results from studies in several localities of the United States have shown that the one-third of the farms in each locality having the largest-sized business have averaged 2½ times as large labor incomes as the one-third having the smallest-sized business. (Fig. 219.)

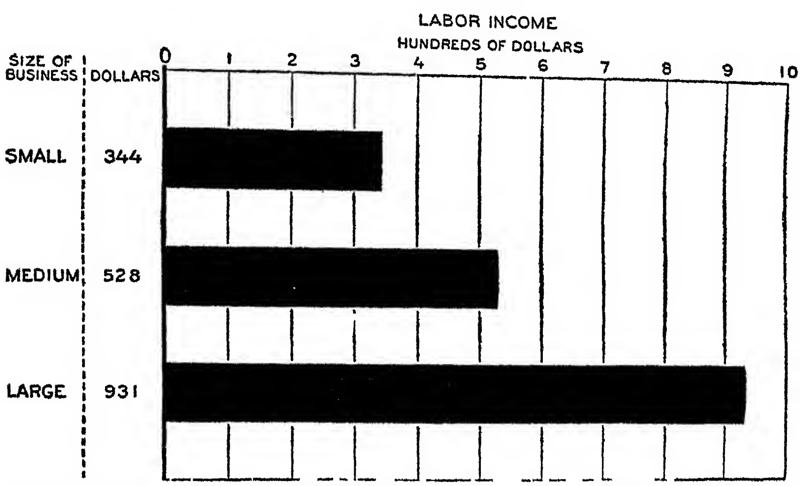


FIG. 219.—Small incomes go with small farm business, and large incomes with large farm business

A good 80-acre corn and hog farm in central Indiana had a $757 labor income for an average of eight years; a 120-acre farm, $1,362; a 160-acre farm, $1,632; and a 240-acre farm, $2,356. A good apple farm in the Shenandoah Valley of Virginia, with 25 acres of bearing orchard, averaged $988 labor income for five years; one with 50 acres of bearing orchard, $1,878, and one with 75 acres, $3,785. Down in Polk County, Fla., a good citrus-fruit farm with 9 acres of bearing grove returned a six-year average labor income of $1,420; one with 18 acres, $2,430; and one with 27 acres, $4,990. In the Palouse country of Idaho and Washington, where wheat is the principal crop, a farm with 80 acres of wheat made a three-year average labor income of $254; one with 140 acres, $536; and one with 280 acres, $1,060.

These examples illustrate that as size of business increases, labor income goes up. This is generally true wherever the locality, and whatever the type of farming, provided it is not an unusually bad year.

The examples also illustrate that size of business is not necessarily the number of acres of land in the farm. Of two farms in a given locality, each with the same number of acres, one may have a much larger business than the other by using more of the land for crops, by growing more intensive crops, or by keeping more livestock. A few acres of truck crops or of fruit may represent as large a business as many more acres of grain and hay crops; or a few high-producing dairy cows, or a few hundred chickens, as large a business as many more animals of the general livestock farming type. In some instances the number of acres of land in the farm is a good measure of size of business; in others the number of acres of crops is better; in some the number of dairy cows or of hens is better; and in others the number of acres of bearing orchard or grove.

Limits to Size of Farms

To emphasize the importance of a the size of farm business is not to recommend that a large-sized business be conducted on every farm nor that all farmers have very large acreages of land, for there are limits to the size of the farm business that a given man has the ability to operate.

There are many farms in the country with a business too small reasonably to expect a return sufficiently large to support a farm family well. If a reasonably high standard of living is to be attained on these farms, the size of the business is of utmost importance, unless there is some other source of income. Out of a group of 50 farms in a locality in middle Tennessee the business was so small that the receipts from 48 of them averaged less than $1,000 in 1925, and after deducting the expenses of operating the farm, 46 of them netted less than $500 each for the living and other expenses of the farm family. The receipts from 190 of a group of 300 farms in the hills of southeastern Ohio were less than $1,000 each in 1926 and after subtracting the expenses of operating the farm, 179 of them netted less than $500 for living and other expenses. To the farmers on such farms as are represented by these groups an increase in size of business is to be especially recommended.

The size of business may be increased by buying or renting more land. This is sometimes necessary but not always advisable. In a group of 22 farms in a locality in middle Tennessee with fewer acres of land in crops than on more successful neighboring farms, 14 could have reached the crop acreage of the more successful neighboring farms without buying or renting more land; some by utilizing the available idle crop land; some by using a little of the pasture land; and some by clearing some brush land that was not producing much at the time.

In addition to increasing the acreage of crops without buying or renting more land, the size of business may be increased by:

(1) Growing crops requiring more labor, or following a more intensive form of farming. A farmer in the hills of southeastern Ohio increased the size of his business by having a few acres in apple orchard from which he sold on the average $50 of apples per acre each year. A farmer in central Indiana increased the size of his business by growing a few acres of canning-house tomatoes.

(2) Adding more livestock sometimes beyond the point that the farm itself will support them. A dairy farmer in eastern Pennsyl-

vania increased the size of his business by adding a few more good cows and buying feed in addition to what he could raise.

(3) Doing work outside the farm. A farmer in the hills of southeastern Ohio with a limited amount of land increased the size of his business by doing some team work in oil fields, and another by working on the roads.

Thus there is usually an opportunity in some way, in every locality, for many of the farmers whose business is very small to increase it to a size large enough to expect a reasonably fair return for the farmer and his family, and thereby raise the standard of their living.

H. W. HAWTHORNE.

SOIL Acidity Helps Some Plants; Others Require Alkalinity That many soils exhibit a tendency to become sour or acid in reaction is widely recognized, and the use of lime to render the soil neutral or alkaline has become practically universal. With the development of convenient methods for measuring soil reaction during the past ten years, however, evidence has been accumulating that our crop plants may differ considerably in their response to the reaction of the soil. While some admittedly give the best yield or the best quality of crop on neutral or on slightly alkaline soils, others do better on soils which are distinctly or even strongly acid. Since crop plants grown on soils which are unsuited to them produce inferior crops, it is evidently a matter of considerable importance to ascertain the soil reaction preferences of the various plants, and to grow each in the soil best suited to its needs.

Various methods for studying the reaction preferences of a given plant may be used. Seedlings may be grown in jars of nutrient solution or in pots of soil of different degrees of acidity and alkalinity. Comparison of the crops from these seedlings will indicate the kind of soil most suited to each crop plant. It is preferable, however, to grow the plant under actual field conditions in soils which resemble one another closely in all respects other than reaction, noting the degree of acidity or alkalinity of the soil on which the best crops are obtained.

The most elaborate study of any plant from the soil reaction standpoint thus far made is that on the sugar beet by O. Arrhenius. He determined the reaction of about 70,000 soil samples from 15,000 beet fields in Sweden, and found the maximum yield as well as the highest sugar content to be produced where the soils showed an active alkalinity of 1 to 4 parts per 10,000,000 (expressed by him logarithmically, as pH 7.1 to 7.6). On the other hand, in Germany Trénel found the best yield of sugar beets in soils with an active acidity of zero to 10 parts per 10,000,000 (pH 6 to 7). Although there appears to be a definite contradiction in these results, the reactions in both cases are so nearly neutral that for practical purposes the optimum soil reaction for the sugar beet may be taken as neutrality. Since similar lack of agreement appears among the work of different investigators on other crops, final conclusions can as yet be drawn on the soil-reaction preferences of very few. The reactions in 25 cases are given in Table 15.

TABLE 15.—*Soil reactions preferred by 25 crops*

Crop	Average soil reaction preference [1]
Alfalfa	Neutral
Asparagus	Slightly alkaline (active alkalinity 1 to 10)
Barley	Do.[2]
Beets	Slightly alkaline (active alkalinity 1 to 10)
Blueberries	Strongly acid (active acidity 100 to 1000)
Cabbage	Slightly alkaline (active alkalinity 1 to 10)
Carrots	Neutral
Cauliflower	Slightly alkaline (active alkalinity 1 to 10)
Celery	Do.
Corn	Neutral
Cranberries	Strongly acid (active acidity 100 to 1000)
Lettuce	Slightly alkaline (active alkalinity 1 to 10)
Lima beans	Slightly acid (active acidity 1 to 10)
Oats	Decidedly acid (active acidity 10 to 100)
Onions	Slightly alkaline (active alkalinity 1 to 10)
Peas	Slightly acid (active acidity 1 to 10)
Potatoes	Decidedly acid (active acidity 10 to 100)
Radishes	Neutral
Raspberries	Slightly acid (active acidity 1 to 10)
Red clover	Do.
Rye	Do.
Spinach	Do.
Sugar beets	Neutral
Watermelons	Slightly acid (active acidity 1 to 10)
Wheat	Neutral

[1] Expressed as parts of active acidity or alkalinity per 10,000,000. The equivalents in the logarithmic pH values often used are: Active acidity 100=pH 5; active acidity 10=pH 6; neutrality=pH 7; active alkalinity 10=pH 8.

[2] Both yield and quality reported to be superior at the reaction given.

E. T. WHERRY.

SOIL Bacteria of Two Main Groups Fix Air Nitrogen

With the breaking up of winter and the beginning of warm spring weather, countless billions of bacteria in every pound of soil start to grow and multiply. It is this development in the spring, and the continued growth of these bacteria during the summer and fall, that interest the soil bacteriologist and are of economic importance to the farmer. It is generally known that without the agencies of decay, life on the earth would soon be impossible, and that only through the continued breaking down of nitrogenous material and the building up of soluble nitrates are most plants able to grow and furnish food for man and other animals. Most arable soil is deficient in nitrogen, especially if it has been cropped. It is therefore important in this day of automotive power and lessening quantities of farmyard manures to know how the supply of nitrogen in the soil may be replenished through the action of bacteria, and what they do with the nitrogen to make it available for higher plants.

Combining the nitrogen of the air into compounds for the building up of proteins within the bodies of certain microorganisms is called nitrogen fixation by organisms. That is, the nitrogen of the air becomes organic matter through the agency of the microorganisms. There are two main groups of bacteria which are able to do this very difficult work (difficult for man to accomplish even with his large factory, expensive equipment, and great electrical power), those which live within higher plants for mutual benefit (symbiosis) and those which live free in the soil.

Nodule-Forming Bacteria

Most conspicuous of the symbiotic bacteria and most important to the farmer are those which form nodules on the roots of legumes, such as alfalfa, clover, and beans. In exchange for sugars and other foods which they obtain from the legume, the bacteria which live in the nodules give to the plant the nitrogen which has been taken from the air. If the soil is rich in nitrogen, the bacteria may use the soil nitrogen instead of that in the air. In this case no special benefit could be expected from growing the legume; whereas in the other case the nitrogen in the soil remained there and more is added from the air.

Whether legumes have nodules on their roots can be seen by carefully digging up (not pulling) the plant and removing the soil. (Fig. 220.) If nodules are not found, it means either that the proper bacteria were not present in the soil or that soil conditions have made them inactive. In the first case the proper bacteria for that legume may be supplied by artificial cultures or brought over in soil from another field where nodules have been produced. In the second case, liming or other treatment is necessary to correct the unfavorable soil conditions.

FIG. 220. Nodules on soy bean roots which have been formed by bacteria which supply the plant with nitrogen taken from the air.

The free-living nitrogen-fixing bacteria of the soil obtain their carbonaceous (sugar) and mineral foods from the soil, and their nitrogen from the air. A demonstration of the activity of these organisms is not so simple as in the case of the nodule organisms, but it nevertheless goes on in soils which are not acid and which contain the necessary carbonaceous food. (Fig. 221, A.) Most farmers know that if a soil "rests" it becomes richer. Though the cause may not be evident, they should realize that in the surface soil are innumerable bacteria and other organisms which are growing, dying, and transforming the inert plant-food elements into available forms.

Bacteria Which Transform Nitrogen

The organic matter added to the soil as farmyard manure, green plants, crop residues, or other wastes are decomposed more or less rapidly, depending on the substance and soil conditions. The nitrogenous portion of this material is attacked by several groups of soil bacteria and other microorganisms, resulting in the production of ammonia. Under normal conditions this never accumulates in a soil. It remains until the nitrifying bacteria oxidize it to nitrate, and as this process is continuous and rather slow, accumulation occurs only with the nitrates. This seldom happens, for in addition to plants most soil bacteria will use nitrates to build up protein in their bodies, which is later transformed into ammonia and then slowly back to nitrate. Probably much nitrate is saved by the bacteria in this way, which would otherwise leach out of the soil and be lost.

FIG. 221.—Soil bacteria as they appear under the microscope when heavily stained. A, free-living nitrogen fixing bacteria (Azotobacter); B, cellulose-destroying bacteria (*B. cytaseus*)

Other Beneficial Soil Bacteria

All straw and other plant material added to a soil are attacked by soil microorganisms. Much of this material is transformed into carbon dioxide. The remainder is probably used for the growth of the organism. (Fig. 221, B.) Bacteria and molds are very active in breaking down this plant material, but in doing this they require soluble nitrogen in the form of ammonia or nitrates. They are then in competition with the crop plants for nitrogen, if there is cellulose present to be destroyed. Being smaller and more active, the bacteria can easily steal the nitrogen, leaving the crop to suffer for want of nitrogen.

There are many other kinds of soil bacteria. Some of them have special functions, whereas others do not, or their function is not yet known. Whether they appear important, every soil microorganism has its effect upon others. What this effect is and how to control soil processes presents problems for scientific investigation, which can be solved only after many years of painstaking research.

NATHAN R. SMITH.

SOIL Erosion Takes $200,000,000 Yearly from U. S. Farmers

Soil erosion takes from the farmers' pockets an annual toll of at least $200,000,000. This is a modest estimate based on the analysis of the principal soil types throughout the Nation and the amount of material washed out of fields, idle lands, and pastures, and carried out to sea by the rivers or deposited on lower slopes, in stream channels, and over alluvial bottoms where it is not needed and often does great damage. The amount of sediments annually carried into the Gulf by the Mississippi River alone amounts to 428,000,000 tons. In addition, 270,000,000 tons of dissolved matter are transported to tidewater every year. Certainly very much more than twice this amount is deposited en route to the oceans every year.

It has been estimated that our farms suffer a yearly net loss of 5,900,000,000 pounds of plant-food elements removed by crops. More than twenty times this quantity is removed by erosion each year. In addition to this enormous waste other things should be taken into consideration—the expensive cumulative effect of the increasing difficulty of cultivation occasioned by the removal of the mellow top soil, the richest part of the fields, the need for more and more fertilizer material to enrich the exposed raw subsoil material, and the taxes paid on land which has been abandoned because of soil poverty brought about by this master thief, erosion.

Rain water that falls upon unprotected sloping areas takes away a part of the soil. Even the gentle showers of springtime, that fall softly upon budding foliage, do not neglect the ultimate mission of rain water to level down the face of the earth. The elements of plant food that are taken out of the soil by crops can be restored in the form of manure and fertilizer, but erosional waters take away, not only the plant-food elements but the soil, which can not be restored.

Next time you find yourself in a rural district after a downpour, you will see, if you look, water speeding away to the rivers and oceans, not crystal clear, but muddied to dun, yellow, or red, according to the color of the soil of the locality. This color is caused by the soil material which has been washed off the land, mainly from cultivated fields. Even in arid regions, erosion is destroying fertile valley areas and valuable overgrazed mountain slopes.

A Difficult Problem

Erosion is the most difficult problem of soil management which confronts the farmers on most of the rolling lands of the United States. It is a very serious problem, also, with millions of acres of ranch land.

Much of this waste takes place so gradually by that process of washing known as sheet erosion that the farmer scarcely notices it while it is going on. Even when the soil has been planed down to infertile raw clay, with spots of bedrock showing in the fields, he frequently ascribes his reduced yields to soil exhaustion; and either abandons the field or continues to acquiesce with the impoverishing bonds imposed by unrestrained rain water.

The more spectacular form of washing is that which gouges out gullies and ravines, in some places to depths exceeding 100 feet. Not less than 10,000,000 acres of formerly cultivated land have been

permanently destroyed by erosion in this country, and more than 3,000,000 acres of rich bottom lands have been irreparably damaged or ruined by the deposition of sand and gravel, and by increased swampiness due to the choking of drainage ways by erosional debris.

Loss from Preventable Gullying

In a single county of the Piedmont plateau, 90,000 acres of formerly cultivated land had to be classed as nonarable, rough gullied land because of gullying that could have been prevented. A survey in another county of the coastal plains revealed more than 70,000 acres of land that have been similarly despoiled. In the great region of brown loam soils (loess soils) along the Mississippi and Missouri Rivers, farming has been largely abandoned in the uplands of some entire counties, because of the gullying. In the arid Southwest, 1,000 acres of onetime fine grazing land, where grew the rich grama grasses, were destroyed by gullying that had its beginning in a prairie-dog town. Thousands of other devastated dry-land areas, where the washing began in cattle trails, roadways, and diversion ditches, are to be seen in that region.

It is the slower form of washing, however, that is doing the most damage. This process of land depreciation is going on in nearly every agricultural county in the central and southern parts of the country, and is causing large losses on some soils in the more northerly and westerly zones. Some soils are more susceptible to erosion than others because of their peculiar physical make-up. Generally, the silt loams and plastic clays are exceedingly vulnerable in this respect, and most of those soils that have unstable beds of sandy or silty material or soft rotten rock beneath layers of clay, cut to pieces badly if not protected by terraces, grass, or forest cover. The shale lands usually succumb rapidly where they have been cultivated long on unprotected slopes whose gradient exceeds 4 or 5 per cent. In some parts of the Central States as much as 18 inches of soil have been worn away by slow, sheet erosion on fertile silt loam that was brought under cultivation less than two generations ago. In the Appalachian Plateau some of the smoothest shale and sandstone soil (Dekalb soil) has lost from 4 to 14 inches of topsoil in fields where the forest stumps have not yet rotted away.

The Scourge of the Fields

The human tragedies these devastated areas and severely impoverished fields could tell will be remembered in many instances only by the monuments of gullies and ravines and wastes of weeds and brush left to mar the landscape.

With our vast land resources we have given little thought to soil conservation. We have been too busy with other things. The problem has now become a national menace. We must do very much more than we have been doing to save our farming and grazing lands. There is immediate necessity for a tremendous awakening to action. Many millions of acres that are being farmed really represent forest lands and should be used for growing timber and grass only. Most of the rolling lands that are being used continuously for crops should be terraced to check erosion. Increased humus

supply in the soil from better crop rotations will prove effective on certain soils to check erosion. Other lands will surely be ruined if they are not terraced. In some localities the farmers have been very active with the building of land-saving terraces; but the activity needs to be increased and spread out on a vastly larger scale. In the region north of the latitude of northern Oklahoma and Tennessee, terraces are seldom seen, although need for them is exceedingly great. Millions of farmers have never seen a hillside terrace.

Need for Research and Demonstration

On some classes of land we do not yet know just what type of terrace will succeed best. We know that these embankments for checking the flow of run-off water, and consequently its cutting effect, have failed in some instances. There is need for research work to ascertain the cause of the difficulty. Probably terraces on certain kinds of land will require very careful adjustment to slopes, or special features of construction, or reinforcement with a cover of grass or shrubs or vines. We do not know, but we must learn as quickly as possible.

It must be remembered that the soil material which is taken out of fields and carried down the streams does not lessen the volume of stream water but increases it very materially. If the soil material is kept in the fields and on the ranges where it belongs (and most of it can be kept there), we will do much to reduce the menace of floods, for the protected slopes will not only hold back soil material but will store more water in the subsoil for summer use of tilled crops and range grasses.

Every loyal citizen of the Nation should do something to help lessen this tremendous evil of soil erosion by talking about it, by building terraces and dams, by planting grasses and trees on the unstable soils and sloping areas, and by reducing the number of livestock carried on the overgrazed areas. Will you not go out and do something that may contribute to the conservation of our soils?

H. H. BENNETT.

SOIL Moisture is an Important Factor in the Tillage of Land

Practically every farmer who has tilled soils ranging from sands to clays knows that some can be plowed and cultivated equally well when wet or dry, whereas others must be worked when their moisture content is just right in order to put them into good physical condition. He also knows that sometimes a soil should be harrowed immediately after plowing; at other times a few hours after plowing; or again, perhaps, after the next rain. But just what it is that makes soils behave in this way is not well known.

The soil property chiefly responsible for this behavior is granulation. Granulation may be observed by examining with a microscope a small sample of fine soil material wetted thoroughly with water. The tiny soil particles can be moved about until the free water is nearly gone. At this point the contracting water films begin to pull the soil grains into groups, forming soil granules. It is in this manner, when the soil has a certain moisture content and

is drying, that the formation of a granular or crummy structure takes place in the field. At this same moisture content, crumbly soil material has its greatest volume and can be most easily penetrated with a sharp-pointed tool. Crops grow best when the soil has this amount of moisture. In fact, this particular quantity of moisture has such a great influence on the physical condition of a soil that it has been given a name—the critical or optimum moisture content. This amount varies with different soils, being least for sandy soils and greatest for heavy clays.

The changes in granulation which take place with changing quantities of moisture may be seen by taking a spadeful of friable clay loam, wetting it, working it into a plastic mass, and allowing it to dry. It soon forms a hard, almost stony, lump which, if left in the field for a few weeks, or perhaps months, will swell somewhat and then crumble readily to pieces.

Changing of the Soil Structure

In this experiment the structure of the soil material was first changed from granular to single grain by wetting it sufficiently to fill the larger pore spaces with water, so that when the mass was worked the individual particles were moved over each other and the original crumbs were destroyed. Although this change was quickly and easily made, it required the slow processes of nature to restore the granular structure to the puddled soil material. Repeated wetting and drying, with corresponding volume changes, finally developed a crummy structure. This action could have been hastened by breaking the lump when it contained the optimum amount of moisture.

From this simple experiment some of the relationships of tillage to soil structure and moisture can be readily understood. First, it may be observed that a sandy soil which does not have a crummy structure can be worked about as well when it is wet as when it is dry. Light loams have enough fine material in them to give them a slight granular structure. They may be worked satisfactorily under a wide range of moisture condition and easily kept in good tilth. In the heavier soils, in which each ounce of material may consist of billions of millions of tiny particles, granulation should be highly developed. These soils can not be tilled under so wide a range of moisture condition as the loams. However, if a heavy or clayey soil is well supplied with organic matter and lime, it can be plowed and cultivated under both wetter and dryer conditions than if it were poor in organic matter and lime.

Puddling in Heavy Soils

Single-grain structure is undesirable in heavy soils. When they are hard and compact the soil moisture evaporates more rapidly, aeration is inadequate, plant roots have difficulty in penetrating the soil mass, and crops may be seriously injured by a short drought. As rain water can not readily penetrate such a soil, much water, and soil too perhaps, may be lost in surface run-off. It is only when soils are wet that soil structure can be changed from granular to single grain. Plowing a soil when too wet causes such a change, because

the bending and twisting of the furrow slice as it is forced over the moldboard produces a very effective rubbing and sliding movement which destroys the soil crumbs. Heavy rains also destroy the soil crumbs, and puddle the surface layer of cultivated land. When such a soil becomes dry the finest soil particles bind the soil mass so firmly that, if the soil is worked in this condition, clodding results. When one sees a soil in a lumpy condition, as shown in Figure 222, he may be sure of two things: (1) Either the soil had been worked at sometime when it was too wet, or (2) it had been plowed when too dry after it had been puddled by rains or by the trampling of livestock when very wet.

In order to develop and maintain a desirable crummy structure, heavy soils should be tilled at or a little below the condition of optimum moisture, the moisture content at which granulation occurs.

FIG. 222 - This soil, after being puddled by rains, was plowed when it was too dry. Now the farmer must expend much labor and power to produce a good seed bed

(Fig. 223.) When a soil is plowed at this moisture content or where drier, it should be harrowed very soon afterward when the lumps can easily be broken. Sometimes a soil may be wet enough to leave a glazed surface as a result of its passing over the moldboard, but the remainder of the furrow slice may be in good physical condition. In this case harrowing, if done after a few hours to allow a slight reduction in the moisture content of the glazed surface layer, should not only produce a good seed bed but also conserve the soil moisture. A dry plowed soil in a hard lumpy condition should be harrowed after the next rain when it contains the right amount of moisture

Other Factors in Good Tilth

There are other things which aid in the development of good tilth. Freezing is helpful. So, too, is lime which helps soil material to form into crumbs. Even more effective is organic matter Farmers

sometimes find that when it is too wet to plow stubble land they can plow an adjoining sod field, because of the presence in the soil of many fine grass roots. The "buckshot" clay soils of the lower Mississippi Valley which can be plowed while wet without serious harm, have a high content of both lime and organic matter. Recently, in plowing an apparently uniform field, some English soil physicists

FIG. 223.—When plowing is done at a time when the soil contains the right amount of moisture, the best seed bed results

observed that the force required to draw the plow decreased greatly in a certain part of the field. It was found that chalk (a form of lime) had been applied to this portion of the field over 20 years before.

L. B. OLMSTEAD.

SOILS as Well as Plants React to Fertilizers Used The soil does more to fertilizer than was dreamt of in the old fertilizer philosophy. Soil and fertilizer experiments of recent years have shown that the soil is not to be regarded as a receptacle which merely holds fertilizer until it is needed by the crop. It seems rather that the soil as well as the plant has an "appetite" or affinity for fertilizers. As soon as fertilizers are applied, the soil starts changing the materials that have been carefully prepared by the fertilizer manufacturer and what the crop gets is largely affected by the activities within the soil.

A great deal of study is needed before all the reactions that take place between soils and fertilizer materials are known, but exact knowledge of these reactions will evidently do much towards improving fertilizer practice. At the present time more is known of the net results of these reactions than of the reactions themselves. It is known, for instance, that rock phosphate gives good results as compared with superphosphate (acid phosphate) on some soils but poor results on others, that liming within certain limits may be highly

beneficial, whereas excessive liming may be injurious, that fertilizers which have the same composition but which are compounded of different ingredients often give quite different results, and that different plant food elements show widely different losses in drainage water. Probably some of these facts will be better understood as a result of studies that have recently been made of the fine clay material in soils.

Changes Due to Colloids

It seems that the fine clay material of the soil, usually called "colloid," is responsible for most of the changes that take place in fertilizers, except those that are brought about by the activity of the soil microorganisms. The larger soil particles are comparatively inert. The colloidal material shows little affinity for chloride, sulphate, and nitrate; hence these fertilizer constitutents are subject to considerable losses in regions where the rainfall is heavy. On the other hand reactions take place between the colloids and other (basic) fertilizer constitutents, such as sodium, potassium, and ammonium. These reactions are of the exchange or "swapping" type. Thus, if the colloid takes up some of the potassium of a fertilizer, it releases to the soil water an equivalent quantity of one of its own constituents, usually calcium or magnesium; or, if the soil is markedly acid, acid may be released. The exact quantity of potassium, ammonia, or sodium that will be taken up when a fertilizer is applied to a soil and what constituents will be released depends on the nature of the colloidal material.

The fact that there is an exchange of constituents between fertilizers and the soil colloidal material explains why a change in fertilizer treatment is sometimes beneficial. If a soil is fertilized for a series of years with a single fertilizer, the clay or colloid may become loaded with a single constituent, and have less of other elements to release to crops. Soils on which crops are likely to develop nutritional disturbances following too heavy applications of lime or fertilizers (sometimes called "weak" soils) seem to be those which contain a small quantity of colloid, or a colloid of a low exchange capacity. The so-called "strong" soils, on the other hand, seem to be those which contain colloids that insure a high capacity for exchange.

P. L. Gile.

SORGHUM Grain Can Be Harvested With an Adjusted Combine

The grain sorghums—milo, kafir, feterita, etc.—are grown mostly in the semiarid southern Great Plains area where extensive methods of farming are practiced. One of the principal difficulties in growing grain sorghums is the labor required for harvesting and threshing the crop. The combine or combined harvester-thresher, which is now used for harvesting much of the wheat grown in the grain-sorghum region, also can be used for harvesting grain sorghums. The combine, performing the two operations as one, greatly reduces the labor required for harvesting and threshing. Investigations by the United States Department of Agriculture show that the average combine harvests and threshes about 24 acres of grain sorghum per day and requires only two men to operate the machine. Two men harvest

an average of about 13 acres per day with a grain header, 6 acres per day with the row binder, and 3½ acres by hand. Additional labor is required for threshing the crop after it is harvested with either the header, binder, or by hand. The man labor per acre required for harvesting and threshing with the combine is only one-eighth as much as is used in the usual method of heading the crop by hand and threshing with a separator later.

The combine is not built primarily for harvesting crops like the sorghums and requires certain changes and adjustments to avoid leaving too many heads in the field. Extra slats bolted on the reel arms of the combine and wire fencing placed at the back and outer end of the cutting platform prevent the loss of heads which otherwise are likely to be thrown out by the reel.

The space back of the chaffer should be covered with a piece of sheet metal, which prevents most of the "pomace" of crushed stalks and leaves from passing through the thresher again. The overloading of sieves and the tailings elevator is largely avoided when this pomace is blown out, and the threshing is improved considerably. Green material, which if present may cause heating, also is prevented from getting into the threshed grain.

Grain Sorghums Easily Cracked

Grain sorghums are easily cracked in threshing, so the speed of the threshing cylinder should be only half to two-thirds the speed neces-

FIG. 224.—Harvesting a field of Dwarf milo with a combine

sary for threshing wheat. Other parts of the thresher should move at normal speed. In order to obtain the proper speeds, combines should be equipped with special sprockets and pulleys which can be obtained from the manufacturers. One or two rows of concave teeth usually are sufficient for threshing grain sorghums.

Care in selecting seed and obtaining uniform stands of sorghums in the field also is essential when the combine is to be used, as clean harvesting is possible only with a uniform crop. Dwarf erect varieties of grain sorghum are much easier to harvest than varieties with tall or curved stalks. (Fig. 224.) Dawn (Dwarf) kafir and Straightneck milo are among the varieties most easily harvested with a combine. The ordinary dwarf and standard varieties of milo are

rather difficult to harvest because of their irregular height and recurved or gooseneck heads.

It is desirable to delay harvesting grain sorghums with the combine until after frost or until the crop is fully matured. Many farmers harvest before frost, however, because of the danger of the stalks lodging when they become dry. Lodged sorghums can not be harvested successfully with machinery and must be cut by hand.

Sorghum grain harvested and threshed with the combine usually is too damp for safe storage but can be dried by dumping it in long narrow piles on the ground or in thin layers on bin or barn floors. The low rainfall and high evaporation during the harvest period in the grain-sorghum region usually makes it possible for the grain to be piled out of doors for a time without injuring its quality.

Many farmers who harvest their grain sorghums by other methods use the combine for threshing the heads. Threshing with the combine is just as efficient as with the ordinary grain separator and fewer men are required to operate the machine. After removing the sickle and reel the combine is drawn up to a rick, and the sorghum heads are pitched on the platform canvas which carries the heads to the threshing cylinder.

Farmers are advised against purchasing a combine especially for harvesting grain sorghums, because of the high cost of the machine, the heavy wear and tear on the machinery in sorghum fields, and the limited acreage of grain sorghums which can be harvested safely before the stalks may fall down. The farmer who already owns a combine, however, can reduce substantially the labor required to harvest grain sorghums, or can save the expense of hiring a custom thresher by threshing the headed crop with the combine.

J. H. MARTIN.

SQUASH of Hubbard Variety Attacked by New Leaf Spot

A new and serious leaf spot of Hubbard squash has been confused by some market gardeners with the angular leaf spot of cucumbers because of somewhat similar symptoms. Specimens of leaves almost completely covered with spots were first received from New York, and the cause of the trouble was determined from them. Since then the disease has been found in many fields of Hubbard squash and Boston Marrow, and in a few cases on pumpkin and Yellow Crookneck summer squash. It has not been found attacking cucumbers and can not be produced on cucumbers by inoculation, although on squash infection by inoculation is easily obtained.

Spots have not been observed on the fruit, but the leaves are sometimes so badly infected that the yield is materially decreased in size and quality from the loss of foliage.

The spots are conspicuous because of their bright yellow halo. At first they are small and round, becoming angular as they are restricted by the veins of the leaf. As they increase in size they join to form large brown areas, the yellow margin now surrounding the whole of the diseased part. Eventually the whole blade may be involved. Although some of the small spots become so papery thin as to lose the brown color and become translucent, they do not tear and drop out as in the angular leaf spot of cucumber.

The spots swarm with bacteria, which are able to produce similar spots on healthy leaves. The disease is spread chiefly by rain. It has been observed to run like wildfire during a protracted rainy spell. The bacteria ooze to the surface of the leaves and are spattered from leaf to soil and from soil to fresh leaves They also reach the soil

FIG 225—Leaf spot of Hubbard squash

through the decay of dead leaves. Although squash bugs, aphids, and striped cucumber beetles were present in infected fields, there was no evidence that these were carrying the disease. Circumstantial evidence points to the seed as the guilty party in carrying the disease over winter and from place to place.

MARY K. BRYAN.

STEER-FEEDING Risks Less When Animals Selected Carefully

Feeder steers show as great a variation in conformation, finish, and quality as do slaughter cattle. They also have the additional handicap of being bought for use from 90 to 150 days later, whereas slaughter cattle are bought for immediate use. This deferred use constitutes a gamble in feeder-cattle buying, for the cattle are expected to consume high-priced concentrates at a profit and to continue to maintain their quality and beef type conformation while fattening.

FIG. 226—Note the good broad head and quiet intelligent face on this well bred, choice grade feeder

Several points aside from the immediate physical characteristics give indications of good or bad future fattening results, but over half the story is told in the head and face of the animal. It is here that what may be termed the "personality" of the steer is shown. The broad forehead, bright clear eyes, short broad nose, full nostrils, and square jaw, which are stressed in husbandry as indicative of good constitution and feeding capacity, also indicate, to the commercial feeder buyer, that this type of animal has intelligence and quiet temperament, and will pay strict attention to business with little lost motion. (Fig. 226.) Most cattle having this desirable type of head and face come from long lines of selected breeding effort, directed towards producing the ideal beef-type conformation of broad loin, well sprung, deep rib, and full thick round which are the carcass cuts in greatest demand and which sell at the highest prices.

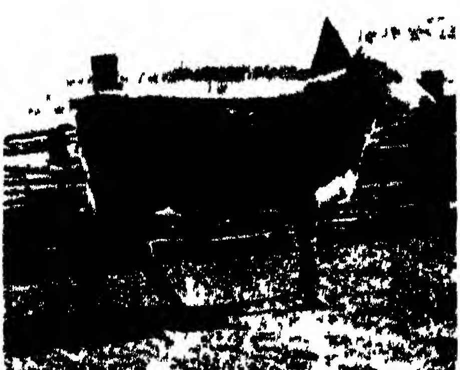


FIG. 227—Note the long narrow head and nervous excitable face Also the fine-bone poor-beef type

On the other extreme is the narrow face, close-set eyes, slender muzzle, narrow jaw and bottle-neck throat, generally accompanied by fine bones, slender frame, and long legs, which type of conformation indicates lack of capacity to take high-priced concentrates and use them to advantage. (Fig. 227.) In their facial expressions these show the finicky appetite, and nervousness which means wasted feed through constant restlessness, and the noticing and investigating of all new or moving objects. Commercial feeders as a result of study of facial characteristics recognize these in advance as poor fattening cattle, from a profit point of view.

A Wasteful Type of Feeder

Another distinct type is the heavy-boned, coarse-shouldered, rough-jointed, angular steer (Fig. 228.) Such an animal almost always has a dull, sluggish appearance and heavy coarse jaws and head. This type usually has cavernous capacity, lays on rolls and patches of tallow and produces coarse-grained meat of only fairly bright color. This type is wasteful partly because it does not produce what the consuming trade expects and is willing to pay for, and partly because the coarseness, shown as a feeder, develops out of all proportion to fat gains so that the steer is finally assigned to a lower grade as a slaughter animal than he was as a feeder.

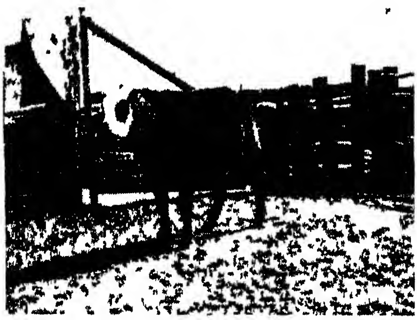


FIG. 228.—Note the large head and dull face and eyes of this ox type of steer. Also his coarse shoulders, heavy paunch and rough frame

Between these three primary types all other feeder steers can be classified and graded. The best grades can be bought profitably, under normal market conditions, at a premium over average feeder-cattle prices and will respond with liberal results both in pounds gained and in economi-

FIG. 229.—"Six in a row," showing three different "steer personalities." A, E.—Note the slender heads and small, refined muzzles and jaws of a fine-boned, unsatisfactory feeder. B, D, F.—Note the broad, intelligent foreheads, width between the eyes, the square muzzles and jaws of the thrifty feeder. C.—Note the long, dull, dished face of a coarse-framed, rough-boned feeder

cal utilization of the tonnage of feed. The lower grades have feeding possibilities based only on relatively low purchase prices. If bought at prices sufficiently below the better grades they may put on enough fat to raise the slaughter value enough to show a profit

through price enhancement, but not by pounds of gain or cheap utilization of feed. If bought cheaply enough, they may return a profit in conversion of cheap roughage.

As the cowman is the basic cattleman and the returns from his years of effort, care, attention, and investment are the foundation of good times or bad in the cattle industry, he can not under normal conditions afford to raise the lower-grade feeders. The wide price spread between the several grades— choice, good, medium, and common —indicates the possibilities for loss if he does not choose wisely in all of his production operations. The feeder-cattle buyer, on the other hand, is merely a converter of raw products (unfinished cattle and corn or other concentrates) into finished articles (fat cattle and beef) and is therefore a manufacturer. He estimates final returns and compares them with present differences in price, as a guide to determine whether he should buy and feed better grade feeders or the poorer grades; and whether lightweight or heavyweight animals will consume his feeds with the greatest profit to him and the least financial risk.

JAMES K. WALLACE.

SUGAR-BEET Disease Called Curly Top Limits Production The curly-top disease of sugar beets, which is a virus malady transmitted by the leaf hopper *Eutettix tenellus*, continues to be a limiting factor in many of the beet-growing areas of that part of the United States west of the Rocky Mountains. The seasons of 1924 and 1926 were characterized by disastrous losses due to this trouble in Idaho and Utah. The year 1925 was marked by a very destructive outbreak in California. It is perfectly evident, therefore, that this as well as certain other adverse factors must be controlled before the beet-sugar industry in the far West can become stable.

The beet-growing areas which have suffered most from curly top are those of the States of Washington, Oregon, Idaho, Utah, the western slope of Colorado, Nevada, and California. Occasionally cases of the disease have been noted east of the Rocky Mountains, but the leaf hoppers have not been found in abundance except in the southern part of this great area. It seems clearly demonstrated that limiting climatic factors have prevented the insect from becoming established in northern Colorado and invading the sugar-beet sections of the Middle West. The distribution and seriousness of the disease of course correspond to the occurrence and abundance of the leaf hoppers.

Time of Planting and Good Farming Helpful

The only measures which have thus far been put into practice in the effort to obviate the curly-top losses are based on observed habits of the leaf hopper and the fact that the susceptibility to the disease shows a sort of negative correlation with age. The study of these two features of the problem has made possible intelligent recommendations as to the time of planting most advisable. In general, planting as early as is feasible is best, but in certain restricted areas postponement of planting until after the flight of the leaf

hoppers from their natural breeding grounds has proved more effective.

In addition to adjusting the time of planting to suit regional conditions, attention to good agricultural practices recognized as indispensable to successful farming is especially important in curly-top areas. The grower who gets the extraordinarily large crop under normal conditions is usually the one who has the highest yield in a severe curly-top year. The larger a beet plant is when exposed to infection the less injury it will suffer. It is, therefore, very important that sufficient moisture, a high state of fertility, and proper physical condition of the soil be maintained in order to facilitate rapid growth in the early stages of the plant. Where an abundance of water is available, frequent irrigation is usually advisable throughout the season, because one of the effects of the curly-top disease is

FIG. 230.—Resistance to curly top of sugar beets. Note the contrast between the resistant strain, rows 12C and 13C, and the check rows of a commercial variety between them and to the right. All were similarly exposed to infection

to kill back the long side roots so that the beet has to depend on the fresh rootlets which do not attain sufficient length to secure water from as wide an area of soil as do healthy plants. Frequent irrigation also greatly benefits the growth of the healthy plants and those in the early stages of the disease.

No Control Yet Discovered for the Leaf Hopper

The way to control the curly-top disease which would at first appear most obvious would be to eliminate the agent responsible for dissemination of the virus, namely, the leaf hopper. Needless to say, extensive efforts along this line of attack have been made. Poisonous and repellent dusts and liquid sprays have been tested. Various methods of trapping and of directly killing the insects have been tried. Studies have been made of the natural enemies already

present in the infested areas, and search has also been made to some extent for parasites in foreign countries The results of all this work have not encouraged the hope that a way of eliminating or effectively controlling the leaf hopper will be developed.

Resistant Strains

Because of the fact that the prospect of controlling the leaf hopper does not seem hopeful, the only alternative left is to manage in some way to so handle the beet crop that profitable yields can be obtained in spite of the disease which the insect spreads The most satisfactory way to accomplish this result is through the development by selection and breeding of strains highly resistant to the disease Work in this direction has been in progress for several years, and the progress made is decidedly encouraging. (Fig. 230) The method of procedure is to select from very severely affected fields the relatively few and scattered individual plants which are by comparison only slightly injured by the disease. Seed is then produced from such mother beets and the resulting progeny exposed to severe curly-top conditions. In addition to this work, many strains of sugar beets selected for desirable characteristics other than curly-top resistance have been purposely exposed to the disease. Similarly, practically all the known commercial varieties and also a fairly extensive lot of selections of the wild beet from Europe have thus been tested. The results so far obtained indicate that no strain or commercial variety produced heretofore without regard to curly-top resistance is satisfactory from the viewpoint of resistance to this disease. It therefore appears that the only hope is to produce the desired strains by selection and breeding. Enough progress has been made along this line practically to assure the eventual accomplishment of the desired results.

Eubanks Carsner.

SUGAR-CANE Cream a New Product of Commercial Value The economic condition of a section of the Southern States is partly or totally dependent upon sugar cane as an agricultural product. The consumer of the present day prefers the pure white refinery sugar, which has resulted in the abandonment of the manufacture of the plantation granulated sugar to a large extent. The change in the taste of the consumers is reflected likewise in the manufacture of sirup. The Georgia type of sirup apparently is slowly displacing the Louisiana sirup, so that as the old plantations are handed on to the newer generations no little effort is made to meet these changing conditions. These factors are necessitating the adoption of a new program for the industry.

One phase of this program is cultural, and steps have already been taken to replace the old and faltering varieties of cane with promising, hardier, and disease-resistant types. The other phase is strictly a technical one, embodying means of utilizing the cane crop more efficiently. The principle of diversification in the manufacture of sugar products is already established in a majority of the factories, and they are equipped to manufacture a number of the old standard products—raw sugar, plantation granulated, yellow clarified

sugar, sulphured sirup or molasses—depending on the market value of these products. To some extent now there may also be manufactured the unsulphured or Georgia type of sirup. It is believed, however, diversification is not sufficiently extensive to derive the greatest value from the cane crop under present conditions, and it is suggested that specialties, such as cane cream, be developed to meet these new conditions.

The new product, cane cream, is being developed and sponsored by the Carbohydrate Division, Bureau of Chemistry and Soils. It is designed to supplement rather than displace the manufacture of sugar and sirup, thereby assisting in the diversification and increasing the scope of the market for sugar cane products, factors which have a direct bearing upon the value of the cane crop to the producer.

The manufacture of cane cream from sirup is not difficult. The process consists of evaporating the sirup in an open kettle to a high predetermined density, judged by its boiling temperature; cooling this sirup and crystallizing a portion of the sugar therein with continuous stirring with a "cream beater" similar to that used in making sugar fondant for coated confectionery; and warming slightly the finished cream in a jacketed remelt kettle, in order that the cream may flow into the containers of tin or glass.

Cane Cream Defined

Cane cream, physically speaking, is an intimate mixture of microscopic sugar crystals surrounded by a film of sirup remaining after crystallization has taken place. The quantity of sirup and the size of the crystals in the mass determine the consistency of the product, which may be altered to suit the purpose for which the cane cream is intended. As a sweet spread for sandwiches, crackers, waffles, and hot cakes, cane cream is ideal, because none need be wasted or lost, and it satisfies the desire for a concentrated or heavy-density product. To produce it satisfactorily as a sirup is extremely difficult. If cane cream is to be used as a ready-made cake icing, it may be made a little stiffer by boiling to a higher temperature in the process of manufacture. To apply the cane cream to cakes or cookies as an icing, it is gently heated in a double boiler until sufficiently thin, when it may be spread easily. The surface of the icing will quickly harden on cooling, but it will retain its soft consistency beneath.

Cane cream retains the original cane flavor in a more concentrated form; it retains also the food value of the sirup.

The keeping qualities of cane cream are excellent; in this respect it is much superior to cane sirup. It should, therefore, be possible to market such a product the year round without the danger of loss which results from spoilage during the warm summer months. Only the larger sirup producers or cooperative-marketing organizations, with their expensive system of cold storage warehousing, are able to distribute sirup during the summer; whereas the smaller and independent producers must rely on marketing their stock of sirup before the warm weather begins. If these producers could manufacture a part of their cane crop into cane cream, they would have a product that could withstand the warmth of summer, which would give them an income from the cane crop the year round rather than during the usual four to six months.

Cane cream may be only one of several specialties that will assist in the diversification of sugar-cane products. As its manufacture has been proved to be practical, the success or failure of its development depends upon the consuming public.

H. S. PAINE and
R. T. BALCH.

TAX Study Shows State Income Levy May Aid Farmers The increased use of State taxes on individual income has been suggested as a means of reducing the farmers' tax burdens. The fact that 12 different States are using these taxes makes possible an analysis of their results and of their possibilities in accomplishing the purpose for which they have been suggested.

The majority of the State income-tax laws follow similar lines, although their details and rates are varied. An exemption ranging from $800 to $3,000 in the different States is allowed each single person, with additional amounts for married couples and for dependents. The tax rate on income above the exemption starts at levels ranging from 0.75 per cent to 1½ per cent; with 1 per cent the most common. In almost all cases the rates are progressive, that is, the percentage of income that a person must pay in taxes increases as the amount of his income rises above certain limits. The highest rates in no case exceed 6 per cent, and in the majority of cases they are below this amount. The amounts above which the maximum rates must be paid range from $10,000 to $50,000. In all except three of the States which have individual income taxes there is also a tax on the income of corporations. Two States levy a tax on the income of corporations but do not tax individual incomes.

A State income tax is levied for the purpose of securing revenue. Any appraisal of its success or failure must be based partially at least on its productiveness. A comparison of amounts raised by income taxes in the various States would be almost meaningless, as conditions vary so greatly that what seems a large amount in one State is of little consequence in another. The amounts reported in the latest year for which data are available range from $72,692,776 collected in New York to $335,714 in Oklahoma. A comparison of these amounts with the total amounts raised by State and local taxation gives an indication of the present importance of the income tax in those States where it is in use. Available figures for 1926 indicate that in no case was more than 10 per cent of the total revenue collected by the State and local subdivisions derived from the income tax. Five of the States using the income tax derived from 7 to 10 per cent of their total tax revenue from this source. Three secured from 4 to 7 per cent, the same number from 1 to 4 per cent, and one collected less than 0.5 per cent. When the total amount collected by means of the income tax is compared with the total tax receipts of the State government alone, it is found that New York's and Wisconsin's income-tax collections amount to almost 45 per cent of the State total, while Mississippi's amounts to 22 per cent. The share in each of the other States amounts to less than 20 per cent, running as low as about 2 per cent in Oklahoma.

Reduction Small in Property Levy

The results that have been cited do not indicate that even in those States where the income tax has been most successfully applied a large reduction from this source in the tax on general property has been possible. The percentage of the general property tax going to the State government amounts on the average to about 10 per cent of the total collected by means of this tax. If the income tax is sufficient to make possible the discontinuance of all State levy of the general property tax and is used for this purpose, a maximum average reduction of 10 per cent in the levy on general property is possible. Thus only slight relief is possible, if the State government uses the whole proceeds of the income tax. In five States, at present, a portion of all the proceeds is distributed to local units. It is through such distribution and through the increase in the yields of State income taxes that any material relief to agriculture which may come through this particular source will be derived.

In answering the question relating to the possible increase of revenue from the State income tax it is of interest to compare the proceeds from the State and Federal income taxes. South Carolina collected over 20 per cent more, and North Dakota nearly 70 per cent more, than does the Federal Government through individual income taxes levied on their citizens. North Carolina and Virginia collected slightly more than half and Mississippi over three-fourths as much as does the Federal Government. Contrasted with these are Massachusetts, collecting only 43; New Hampshire, 35; Delaware, 30; Missouri, 15; New York, 14; and Oklahoma, 5 per cent of the amount collected by the Federal Government. It should be recalled that while the Federal rates range much higher than those of any State, the Federal exemptions are high enough to relieve small incomes from contributions. It will be noted that those States in which industry other than agriculture is important are the States in which the revenue derived from the Federal income tax greatly exceeds that from the State income tax

Relieving Other Sources

In the strongly industrial States there seem to be possibilities of relieving other sources of taxation by placing more of the tax burden directly on income. This is of particular importance in view of the decreases in the rates of the Federal income tax in recent years and of the further decreases that may be expected in the future as the war debt of the Federal Government is retired.

In those States in which agriculture is the predominant industry an income tax can not, except at excessive rates, yield returns that would make possible great reduction in the burden on general property. But even in these States such a tax, with moderate rates, could be made to yield a sufficient return to reduce somewhat the direct burden on real estate and would have the advantage of making a portion of the tax system more directly responsive to changes in ability to pay taxes.

It is believed that so far as a reasonable income tax is concerned—and certainly none of the State systems in effect at present can be called unreasonable—the use of such a tax will make the State's revenue system more equitable for all groups. Its introduction may,

however, have a temporary adverse effect upon industrial development if the tax is imposed before public opinion becomes sufficiently informed to appreciate its fairness. The varying laws of our different States also make evasion of an income tax possible and probable if the tax is prematurely introduced. The State income tax should in all cases be preceded by extensive educational work.

Possibilities in Industrial States

From an agricultural point of view, then, the State income tax promises most in those States in which there are large industrial populations and enterprises that contribute less, proportionately, than does agriculture in direct taxes. It will form a desirable part of the tax system even in those States in which its present yield will be small and in which most of that yield will come from agriculture and related industries.

It is necessary to bear in mind that certain groups appear to doubt the fairness of the State income tax and to fear its effects. Their doubts and fears seem erroneous, but the successful introduction and maintenance of a State income tax will tend to be dependent on an educational program that will convince the majority of all groups of the population that the new tax is a step toward making the financing of government more equitable from the point of view of all people of the State.

WHITNEY COOMBS.

TEA is Often Ruined by Being Packed in Improper Containers All housewives, especially those living in the rural districts, where large-scale buying of staple groceries is more common than among those who live just around the corner from a handy retail store, are interested in getting tea, as well as coffee and other foods that deteriorate readily, put up in the kind of package that will best preserve the original flavor and good quality of the product. The diversity found in such packages led the tea-control laboratory of the Food, Drug, and Insecticide Administration to undertake a two-year investigation of the keeping qualities of more than 100 types or subtypes. A series of five quarter-pound packages of each type of containers were filled by the tea packers cooperating in the test with a medium-quality black tea and a medium-quality green tea, originally bought by the Government and forwarded to the commercial packers in well-seasoned friction-top containers. Each five-package unit, as soon as it was received in the laboratory, was placed under storage conditions representative of those that obtain in a retail grocery store or in the pantry of a private home. The same tea packed in a quarter-pound slip-cover tin container served as a check throughout the test. Every six months the tea in one package of each type is compared with that in the corresponding check package by an expert tea taster and the results are recorded.

Although the two years of the test are not quite up, the results so far obtained show conclusively that much of the tea sold in the United States is ruined by lack of care in packing. Obviously, the paper bags or pasteboard cartons, which may preserve tea satisfac-

torily in wagon routes or in chain stores where there is a quick turnover, are not the thing for tea held on shelves in retail stores or in homes for long periods or shipped for long distances, especially from one climate to another. But how much attention has been given to this fact in the past?

Long Preservation Possible

Ascertaining the best means of preserving foods as determined by moisture tests of the products before and after storage and chemical analyses of the container material has led to an improvement in the packaging of food products, but it is believed that the organoleptic methods employed in the test now under way will be of greater value to packers and buyers. The actual depreciation as indicated by the reduction in quality of the tea packed in the various containers will show definitely the comparative value of each type of package. When these results are made public each packer will be in a position to select the package best suited to his particular needs and the housewife can avoid buying tea in packages that will not stand up well under the storage conditions in her home.

The department's investigation has shown that tea, coffee, and similar products can be kept in practically perfect condition for indefinite periods of time if certain methods of packing are adopted. Based on the results so far obtained, much constructive advice has been given to packers of tea and other food products. Even before the final report is published, therefore, the consuming public will have profited by the department's findings.

George F. Mitchell.

TENANTS and Owners Should Make Lease Contracts in Writing

Approximately 3,000,000 of our farmers operate land which they do not own. Once each year most of these farmers renew or alter the agreements they have had with landowners or enter into new farming agreements on other farms. Each year hundreds of thousands of inexperienced persons make their first contracts as landlord or as farm tenant.

A great many farms, perhaps most farms, are leased through oral agreement without printed or written memoranda or lease of any kind, and some landlords and tenants take a certain pride in the fact that their contracts are informal to this extent. Whether or not the agreement of lease is in writing, it is dangerous for the contracting parties to slight the business of arriving at a complete understanding in all points where their interests are likely to clash later. The lease agreement is the basis of the relationship between landowner and tenant, and a careful consideration of its terms may have much to do with promoting harmony and mutual satisfaction, lengthening the period of occupancy, and improving the methods of farming the land.

Many of the disputes and misunderstandings which arise during the lease would not have arisen, or could be quickly ironed out, if agreements of lease were all entered into with due care and were properly put down in writing. The very attempt to put a lease in writing is likely to result in a more complete understanding than would be reached if no such attempt were made. If the lease has been put in writing, even though it is never looked at again, its prop-

aration will have cleared up points that might have remained obscure or might have led to later disputes.

If the farm is to be leased for a cash rental, the agreement is likely to be a simple one which may be satisfactorily expressed by a standard printed form with a few modifications or additions.

Most printed lease forms, because they contain only generalities, are likely to prove inadequate when landowner and tenant enter a share agreement. In share agreements the capital, credit, and particular ability, experience, and purposes of landowner and of tenant all need consideration, along with the conditions of farming and the opportunities afforded by the farm. Usually it is best for share-renting landowners and tenants to confer on the features of the contract, reach an agreement, and then write a lease embodying the various stipulations. If the values involved are considerable, or if one or both parties fear that the other would try to take advantage of obscure or questionably phrased sections, it is best to seek the advice and assistance of a good lawyer before signing the contract. Although a carefully considered lease should do much to promote a harmonious relationship between landowner and tenant, it will be futile in preventing trouble unless each party has the proper attitude toward the other.

Sharp Bargain May Be Bad

Before concluding the agreement each party should carefully consider not only the fairness of the various parts of the bargain but the general desirability of the bargain as a whole. A sharp bargain may be the cause of hard feeling and prove a bad bargain. If unusual concessions are desired by either party, he can best obtain his ends by making it profitable for both parties to agree.

Unless they fortify their memories by memoranda noted beforehand, it is unlikely that landowner and tenant, at a first meeting to consider a lease, will have in mind all the questions that should be settled. It will be well if each takes time, before the meeting, to reflect over matters of the agreement and make note of points which he wishes decided or discussed. A general list of points to be considered in drawing up a lease follows. It should be supplemented by detailed lists prepared by landowner and tenant themselves, covering their specific problems.

Your Farm Lease Contract

Is its full meaning understood?

Is it so written that its meaning will be clear at any later time?

Is it fair to both parties?

Does it give the tenant a reasonable opportunity to make a comfortable living and to get ahead?

Does it require proper and conservative care of the premises leased?

Are all desired reservations to the lease made?

Are the things stated which each party is to do and to contribute?

Does it make clear the rights and privileges of each party?

Does it define the relationship between landlord and tenant and provide for the settlement of differences of opinion?

Does it contain a statement of the procedure to be followed when the relationship of landlord and tenant is to be terminated?

Does it contain the following essentials to a legally complete lease?

1. The date it was made.
2. The names and the final signatures of the contracting parties.
3. The period for which the lease is to run.
4. A description of the property leased.
5. An agreement in respect to the amount of rent to be paid and the time when and the place where it is to be paid.

H. A. TURNER.

TENANT'S Kinship an Important Factor in Renting Farm Land The statement that 38.6 per cent of all farmers in the United States are tenants is sufficient to arrest attention, especially when it is coupled with the fact that there has been a persistent increase of tenant-operated farms, since 1880, when the census first made a separate enumeration of tenant farmers. During the period 1920 to 1925 this increase in percentage of tenant farms was not large, 38.1 to 38.6, but in certain sections of the country there were significant increases.

Tenant farms and tenant farmers are of all kinds, and some classification is worth while before remedies are proposed for an improvement in the systems of operating rented farms. We must at least know who the tenants are and something of their opportunities for land ownership.

Tenants who rent farms from relatives are much more likely to be interested in the farm and the community than those who are renting from nonrelatives. A study of landlords indicates that 84 per cent of tenants related to landlords in the North and West are either sons or sons-in-law, in the South the comparable figure is 60 per cent. The son or son-in-law may pay the same rent as any other renter, but he has some interest in the farm and in most cases in the community.

The rate of return probably does not tell the whole story. The relative more generally receives a larger part of the income as perquisites than does the unrelated tenant. All the available evidence, however, indicates that concessions are made to relatives. A study by the United States Department of Agriculture shows that in practically all cases the landlord receives a smaller return from farms rented for cash to relatives.[10]

The agricultural census for 1925 furnishes comprehensive information for the Northern and Western States concerning the number of tenants who are related to their landlords as sons, sons-in-law, grandchildren, brothers, or sisters. Some additional information has been tabulated by the Department of Agriculture with reference to cash tenants in Southern States.

Wisconsin's Kinship Percentage High

Among the States in which the number of tenants is large, Wisconsin has the highest percentage related to the landlord, approximately 40 per cent, while North Dakota is the lowest, slightly more than 20 per cent.

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[10] CHAMBERS, CLYDE R. RELATION OF LAND INCOME TO LAND VALUES. U. S. Dept. Agri. Bul. 1224, p. 54. 132 p., illus., 1924.

TABLE 16.—*Per cent of cash and other tenants related to landlords by divisions, 1925*

Class of tenants	All Northern and Western States	New England	Middle Atlantic	East North Central	West North Central	Mountain	Pacific	Southern white[1]	Southern colored
	Per cent	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Cash	26.6	16.0	20.1	30.8	31.1	11.3	10.8	12.8	3.9
Other	29.1	30.9	28.2	32.8	29.0	15.9	20.9		

[1] From a tabulation by the Department of Agriculture including most of the Southern States.

Probably no conclusions should be drawn as to variations in the percentages of cash and other tenants related to landlords in the different divisions. Whenever cash tenancy is common, as in the North Central States, farms are rented to relatives on that basis about as frequently as on any other.

The large number of negro tenants in the South lowers the percentage of related farmers, since most landlords are white. A comparison of the percentage of white cash tenants related, 12.8, with that of colored cash tenants related, 3.9, seems to be fairly conclusive evidence that negroes do not rent farms from relatives to the same extent as white farmers.

It is also noticeable that about half as high a percentage of tenants is related to landlords in the South as in the North, the figures being 26.6 in the North and 12.8 in the South.

In those sections where tenancy is very important a considerable proportion of the tenants are related to the landlords. In more than half the counties of the Central States above 30 per cent of the tenants are related to their landlords. In the extreme Eastern and in the far Western States a larger proportion of counties have a lower percentage of related tenants.

Variations Not Accounted For

No attempt has been made to account for the variations in the proportionate number of tenants related to landlords in different parts of the country. Some of the variations are due to the custom of transferring farms from one generation to another, some to the number of children remaining on farms, some to the racial groups involved, some to the amount of land held for speculation, and some perhaps to other factors.

The fact that so large a proportion of tenants are relatives of their landlords is significant, because such tenants are likely to have a degree of concern in the upkeep and care of farms comparable with that of an owner operator, and many are operating as tenants preparatory to assuming the full ownership of the property by inheritance or some other mode of acquisition.

O. M. JOHNSON.

TICK Eradication Opens New Field for Better Cattle That the development of the beef and dairy industries in the southeastern section of the United States has not kept pace with the general progress in the Southern States is well known. However, outside of that section it is not generally understood that this stagnation, in a country where the potential possibilities for this industry are the best, has been principally

caused by the cattle or fever tick. Nor is it generally known that this barrier to a profitable and extensive cattle industry has now been removed from large sections of the South that were formerly tick infested.

For many years this disease carrying parasite made the introduction of purebred cattle for the improvement of southern herds such a risky procedure that it was little practiced, and the sad experience of those who tried it showed that such attempts were useless and impracticable until some means of controlling or removing the tick menace was undertaken.

Following some successful work in eradicating the tick from small areas in North Carolina, national interest was stimulated, and in 1906 the first Federal appropriation was made available with which to begin the work of freeing the South from the cattle tick. This great undertaking was soon started in the tick-infested and quarantined areas of Alabama, Arkansas, California, Florida, Georgia, Kentucky, Louisiana, Mississippi, Missouri, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia.

States Now Safe for Improved Cattle

From the small beginning on July 1, 1906, along the northern line of the infested area, this work has extended to practically all sections of the originally infested territory. As a result of this effort all areas formerly in quarantine in California, Georgia, Kentucky, Missouri, North Carolina, South Carolina, Tennessee, and Virginia have been made safe for the introduction of good cattle from any place and have been relieved of all Federal quarantine restrictions on account of ticks. Large areas in each of the other tick-infested States have also been freed and the embargo removed. (Fig. 231.)

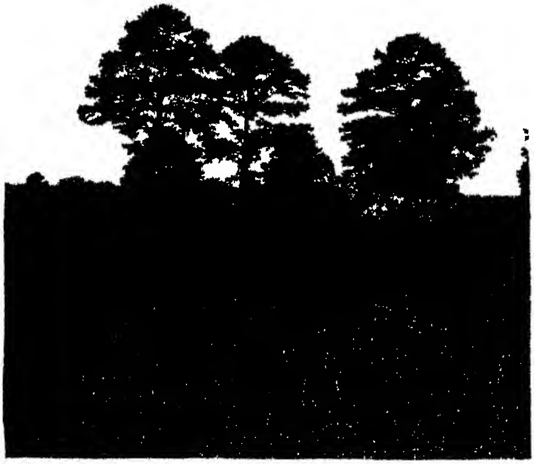

FIG. 231.—Native, south Mississippi cows averaging about 600 pounds in weight were the foundation of this herd of cattle. Tick eradication made possible the use of good-quality purebred bulls, resulting in the improved stock shown above

Notwithstanding that much of this large area has for several years been tick free and therefore safe for the introduction of improved cattle, the relative number of purebred animals introduced has been very small. Several conditions have no doubt had a bearing on this lack of interest, prominent among which probably was the slow cattle market for the past few years and the fact that raising improved cattle and growing feed for them are new ventures to most of the farmers in that region.

With the disease-carrying ticks eliminated, the South is well adapted for the cattle industry. In every Southern State may now be found farms and localities where successful dairy and beef herds are thriving. The State of Mississippi is an outstanding example of what can be accomplished. A few years ago that State was entirely below the Federal quarantine line for ticks, and dairying as an industry was practically unknown within its borders. The tick-free portion of Mississippi is now supporting 22 creameries, 2 milk condensing plants, 2 cheese factories, and about 60 ice-cream factories. It is officially stated that the 22 creameries and 1 condensing plant purchased from the farmers of that State during 1926 a total of 36,393,413 pounds of milk at an average price of $2.40 a hundred for milk testing 4 per cent butterfat. What has been accomplished in Mississippi can and should be accomplished in many other sections of the South. The Southern States now offer a fertile field deserving of careful cultivation for the development of all phases of the cattle industry.

Six Hundred and Fifty-three Counties Freed from Pest

When tick eradication was first undertaken on a nation-wide basis, 985 counties in the several tick-infested States were ticky and in quarantine. Through the cooperative efforts of cattle owners, State and county officials, and the Bureau of Animal Industry of the Department of Agriculture, 653 counties in the area formerly infected are now entirely free from the fever tick, and the southern cattle growers' greatest handicap has thereby been removed.

Information regarding the points in the South to which cattle may be safely shipped may be obtained from the State livestock sanitary officials or by addressing the Chief of the Bureau of Animal Industry, Department of Agriculture, Washington, D. C.

R. A. RAMSAY.

TIMBER Cutting by Selective Logging Replacing Old Way Throughout northwestern Wisconsin and the Upper Peninsula of Michigan there are still large areas of old northern hardwood forest. In the past, and to a large extent even now, these forests have been cut for all the merchantable timber in them. Trees down to 9 or 10 inches have been taken for saw-log timber. Where there has been a demand for cordwood, trees even as small as 6 inches have been cut. The heavy slashing left on the ground has invariably caught fire.

Under the pressure of economic conditions, a change is now being made from clear cutting to what is known as "selective logging." Selective logging means removing the largest and most valuable trees and leaving the smaller and less valuable trees to mature into a second crop.

This new movement has been stimulated by studies by the Lake States Forest Experiment Station and Forest Products Laboratory of the relative profitableness of logging small and large trees. These studies brought out the fact that small trees cost more to log and mill than trees of larger size. At the same time the grades of lumber obtainable from small trees have a lower value than the grades obtained from the large trees. It was found that, as a general rule,

trees below 12 inches in diameter breast high are logged for lumber at a loss.

The cutting on the experimental forest in the Upper Peninsula of Michigan may be cited as a concrete example of selective logging. Twenty acres of a virgin forest of maple and yellow birch were logged during the winter of 1926. A complete cruise of the entire 20 acres showed a total stand of 127,000 board feet, Scribner scale. Some 45,000 feet of logs were marked for cutting, or 2,250 feet in a total stand of 6,350 feet per acre, which is 35 per cent of the total stand by volume. The actual scale of the timber cut proved to be 45,127 board feet, with about 250 cords of chemical wood in addition.

Size and Number of Trees Cut

The average number of trees per acre was 193, and the range in size was from 3 to 36 inches and over in diameter breast high. No trees below 22 inches were cut, except where their removal was considered beneficial to the remaining stand. In all, 169 trees were cut on the 20 acres. In addition, 89 trees were broken down in felling the larger trees and had to be cut up into chemical wood. On an average 8 trees per acre were cut and in addition 4 trees between 3 and 15 inches in diameter were destroyed in logging. Only 3 trees above 12 inches in diameter on the entire 20 acres were broken in logging and had to be cut into chemical wood. Out of an average stand of 193 trees per acre 12 trees per acre were removed in actual cutting and destroyed in logging and 181 trees were left to the acre. Of the trees left, 41 were 12 inches and over in diameter.

A most striking result of the selective logging was the high quality of the product obtained. This made possible the removal of more than one-half of the value and only one-third of the volume of the stand. The average value of hardwood logs cut in ordinary logging operations during the winter of 1926–27 was about $19 a thousand feet on the cars. The maple logs cut under selective logging were worth $27.30 per thousand and the birch $39.31. Since 6,000 feet of birch logs and 39,000 feet of maple were cut, the average value of the logs cut on the 20 acres was $28.93 a thousand. Had the stand been clear cut, the value of all the logs at $19 a thousand would have been $120.50 per acre, whereas, through selective cutting, only 35 per cent of the volume gave a value of about $65 per acre.

The chemical wood produced from the tops and defective portions of the trees and from smaller defective trees aggregated about 250 cords. At 50 cents a cord stumpage for this material the chemical wood brought in an additional $125, or $6.25 per acre.

Selective Logging Not More Costly

The logging cost for selective logging compares favorably with the ordinary logging costs over large areas and on an average is even a trifle lower; also selective logging leaves the forest in a more fireproof condition. Cutting only trees over 22 inches in diameter and utilizing the tops down to 3 inches for chemical wood leaves very little slashing on the ground. The small amount of slashing remains moist in the shade and soon rots. Except for the scattered stumps, there is little to indicate that one-half of the value of the stand has been removed. The stand has the appearance of a virgin hardwood

forest. Since the forest conditions are left intact, the air is constantly moister here than if the stand had been cut clear, and the surface soil remains cooler and damper throughout the critical spring and fall fire season, as well as through the entire summer.

The logging on the experimental forest was done by a local settler, to whom the winter work was a source of income and afforded an opportunity to develop his farm during the summer.

In another 20 years the 41 trees between 12 and 26 inches in diameter left on each acre under selective logging will grow from 2 to 4 inches in diameter. The amount of growth will more than make up for the 2,250 feet removed in the selective logging. In 20 years the growth of the trees left now will bring the stand back to its original volume, and it should be possible to make another selection cut at that time of as high-quality timber and get at least a similar return. With selective logging, then, the forest will be continuously productive, bringing in, according to this example, $47.71 an acre every 20 years, or $2.39 net per acre every year, not counting carrying charges.

RAPHAEL ZON.

TIMBER from Southern White Cedar Pays on Coastal Swamp Land Mature stands of southern white cedar, or juniper as it is sometimes called, will yield 25,000 to 50,000 board feet of timber an acre in 60 or 70 years on the better soils. The wood, which is straight-grained, splits readily, is easily worked, and is decay resistant, has special value for boats, tanks, planing-mill products (including siding and finish), boxes, and crates; and for over a century it has met a local demand for other commodities, such as shingles, woodenware, poles, and dock shores.

Southern white cedar grows rapidly in dense almost pure even-aged stands that give heavy yields of high-grade timber. It reaches its best development in the Atlantic and Gulf coastal swamps and estuaries in situations where no other valuable timber tree thrives and on land which would otherwise be practically valueless.

It is easily reproduced. For reforesting logged-off areas, however, seed trees left standing are of little value because of their extreme liability to destruction by fire and wind. A good method of obtaining a new stand is to clear cut in strips. The long way of the strips should be at right angles, or nearly so, to the direction of the storm winds. Reproduction on the cleared strips originates from seed thrown by the trees in the intervening uncut stands. As soon as reproduction has become established on the clear-cut areas, the strips of uncut timber can be logged.

Where logging has left the swamp covered with slash, very few cedar seedlings can make their way through. Slash burning, so controlled that it will destroy the material left after logging but leave the surface peat in which the white cedar seed is stored, may often be necessary to insure the reproduction of fully-stocked stands. The burning should be done the first winter following logging and at such time as the swamp is sufficiently wet to prevent the consumption of the surface litter. Controlled slash fires will also burn back the rank sprout growth of swamp hardwoods, shrubs, and vines and enable the cedar to gain the lead over them.

If it is impossible to burn the slash under favorable conditions the first winter following logging, the area should be rigidly protected from fire for 5 to 10 years.

To produce timber of the highest quality, it is essential in many cases to tend the new stand practically from the start. The trees

FIG 232—A stand of southern white cedar which yielded over 50,000 board feet of high-grade material to the acre when it was cut At $10 per thousand board feet the gross returns amounted to over $500 per acre from the sale of the stumpage

should be sufficiently close together to develop a continuous crown cover under which the lower branches will die before they become large enough to cause large knots in the timber and thus impair its quality. This is generally attained by establishing a stand of a thousand or more trees on an area where only a hundred may be brought to maturity.

Southern white cedar responds to thinning by an increased rate of growth, and as a result of thinnings the volume growth of the stand is concentrated on the smallest number of thrifty trees which will fully occupy the area. All dense stands should be thinned as early as the material removed can be marketed. In New Jersey, where there is a good market for bean poles and other small-sized material, thinnings become profitable at an early age. Farther south thinnings can be made at a profit only in older stands. In all thinnings any swamp hardwoods and other undesirable species should be cut.

The proper handling of southern white-cedar lands offers a means of obtaining profit from lands which have otherwise no present prospects of yielding a profit. If the land shown in Figure 232 had not produced a crop of white-cedar timber, it would probably have been covered by shrubby and inferior species yielding little or no profit.

CLARENCE F. KORSTIAN.

TIMBER with Slight Heart Rot Can Be Used for Rail Ties

Timber with a small amount of heart rot can be utilized for railroad ties. This is important in view of the rapidly decreasing supply of timber, which is being cut about four times as fast as it is grown.

Experiments have been conducted for several years which show that slightly defective timber when properly treated with certain wood preservatives is thoroughly sterilized and can be utilized for ties. Heretofore thousands upon thousands of slightly defective ties have been left in the woods to rot, where they greatly increase the fire hazard during a long period of years. Much of this timber can be used by proper preservative treatment, thereby conserving our rapidly diminishing timber supply.

In one shipment of more than half a million ties over 60 per cent were slightly defective because of incipient heart rot. Practically all of the defective ties were salvaged and utilized by giving them a high-pressure treatment with a mixture of creosote and petroleum oil. All ties defective from heart rot can be utilized if the rot has not reached a stage where the timber is too much weakened mechanically. The pressure treatment kills the active agent causing the rot, so that there is no further growth of the rot after treatment. Such ties can therefore be used with safety on all tracks where the traffic requirements are not too heavy, such as switches, spurs, sidetracks, etc., which constitute more than 30 per cent of the railroad trackage of the country. By utilizing such ties the cost of tie equipment is reduced, since they are cheaper than sound ties, while their use means a great saving in the timber supply.

Pressure Treatment Usually Sufficient

Usually the ordinary pressure treatment given by the big treating plants will sterilize all rot present. A pressure of about 180 pounds held at a temperature of 180° F. for five or six hours will sterilize the usual heart rots found in coniferous timber and also do the same for hardwood ties in most instances. Such a treatment causes the preservative mixture to penetrate every part of the decay, thereby killing the fungus which causes the rot.

No new methods of treatment are necessary, nor is it necessary to install new and expensive equipment in order to obtain complete sterilization of the ties. In some types of rots and timbers it may be necessary to increase the length of time of the treatment, but otherwise no change in present methods and machinery is necessary.

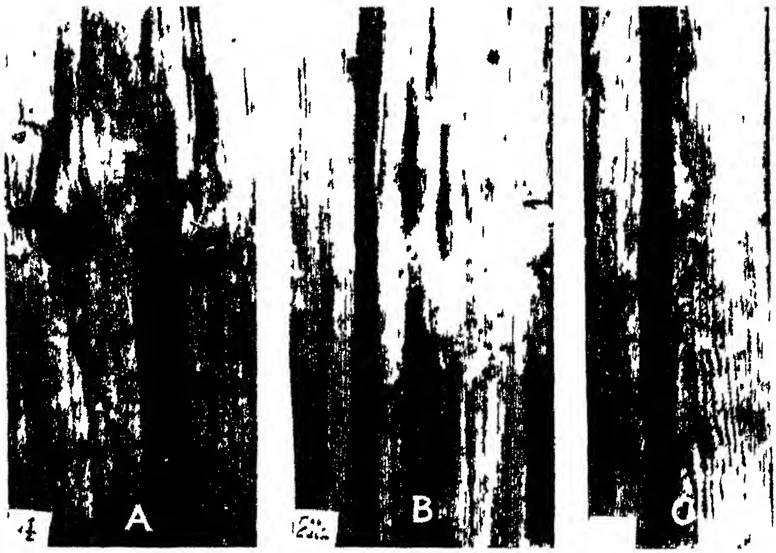

FIG. 233.—Sections from interior of defective ties which have received the standard creosote and petroleum oil treatment. 4, Douglas fir which had been decayed in the living tree by *Polyporus schweinitzii*, 5 and 22, Douglas fir and long leaf pine, respectively, which had been decayed by *Trametes pini*. Note the extent to which the decayed portion has been penetrated and darkened by the preservative

It is therefore entirely feasible and practicable to sterilize slightly defective timber so that it can be used for railroad ties. Such sterilization is accomplished by the high-pressure treatments usually given at all first-class standard tie-treating plants.

W. H. LONG.

TOADS Destroy Many Harmful Insects and Should be Protected Toads are usually thought of as squat, fat, and warty, but there are some smooth-skinned species, one of which inhabits the arid sections of the southwestern United States, and there also is a long-legged tropical toad that reminds one of a frog. All these toads, like frogs, spend part of their early life in the water and are transformed from swimming, water-breathing tadpoles to jumping, air-breathing toads. Of the many kinds of toads living to-day in different parts of the world, both the largest and the smallest belong to the American fauna. The largest, known as the agua toad, ranges from central South America to northern Mexico, and within the United States is a form nearly as large, known as the Colorado River toad. Large individuals of the agua toad may have a body length of 9 inches and a mouth large enough to swallow small birds; they are said to eat rats, but insects constitute the major portion of their food. Probably the smallest living toad is the oak toad, of the southeastern part of the United States; this feeds largely on ants.

Toads are great gourmands, and in the course of a season eat untold numbers of insects, many of which are highly destructive of plant life. They are mainly nocturnal and terrestrial and prolong into the night the general warfare against insects, thus taking the place of the ground-feeding insectivorous birds after these have ceased their activities for the day. Meal time with toads often begins before sunset and continues throughout the greater part of the night; hence the food contains a mixture of diurnal and nocturnal organisms. Included among these are some of the most active predatory ground beetles, but this destruction of beneficial beetles is probably outweighed by the consumption of injurious insects. The value of toads can hardly be defined on a dollar-and-cent basis, however, for they are rarely numerous enough in any locality to be of any marked economic importance. Furthermore, unlike birds, they can not traverse wide stretches of land to aid in combating abnormal local increases of insects and other injurious organisms.

Toads Have Varied Insect Prey

Toads are economically valuable even in their indiscriminate destruction of ground-frequenting insects. In their consumption of certain especially injurious forms, as millepeds, sowbugs, crickets, click beetles, leaf chafers, weevils, and caterpillars, they are particularly useful. Abnormal infestations of extremely destructive weevils occasion a considerable monetary loss to farmers each year, but the potential damage is reduced by toads and other natural enemies.

The stomachs of toads have been found distended with large numbers of adults or larvæ of such weevils as the cranberry weevil, alfalfa weevil, strawberry weevil, clover weevil, and billbugs. Grasshoppers, even where abundant, are a minor item in the food, but crickets are eaten frequently. Flies, because of their fragile, easily crushed bodies, do not bulk so large in the food as do insects protected by harder shells, yet they comprise about one-twentieth of the yearly food of two western species. In reducing the number of adult click beetles, which if allowed to propagate unchecked would add to the number of wireworms feeding on valuable crops, toads render useful farm service, for there is hardly a cultivated plant that is not subject to the attacks of these insect pests. Leaf chafers, which destroy blossoms and defoliate orchard trees, are frequently taken by toads; and it is fortunate that the white grubs of May beetles, which are such pests in lawns, meadows, and cultivated fields, have the toad as an enemy in their adult stage.

In areas heavily infested by gipsy-moth larvæ, apple-tree tent caterpillars, army worms, and sugar-beet webworms toads have been found feeding on these pests. Large numbers of ants also are eaten by toads. Ants are nuisances, and some of the commonest forms aid in the propagation of certain insect pests, as aphids, scale insects, and mealybugs. As a rule, however, ants are given less consideration than are pests that destroy foodstuffs in the garden, field, or orchard. In taking food of this character, therefore, the toad is rendering better economic service than is generally appreciated.

The digestive apparatus of toads appears to be less susceptible than in other vertebrates to the action of stings and such other devices supposed to function in offense or defense as are employed by ants, bees, and wasps, rose chafers, blister beetles, millepeds, and poisonous

spiders. Toads eating such organisms do sometimes show that they are uncomfortable, but they may fail to discriminate between stinging and nonstinging species. Phytophagous millepeds, some of which are known to secrete hydrocyanic acid, also are eaten by toads.

Do More Good than Harm

Without attempting to minimize any objectionable food habits that toads may have, it may be stated that the good they accomplish by feeding on termites, beetle larvæ with injurious or potentially injurious habits, plant-sucking bugs, voracious caterpillars, and other noxious insects more than compensates for the harm done by preying upon those that are beneficial. Although indiscriminate destruction of all sorts of terrestrial organisms characterizes their food habits, nevertheless toads consume large numbers of economically injurious insects, especially during periods when these pests are abnormally abundant, and in these activities they undoubtedly have an important place in nature. Under certain conditions in greenhouses, gardens, fields of small grain or forage crops, and on golf courses toads perform visibly effective service. In any of these situations noxious insects and other invertebrates are sure to predominate; hence the bulk of the toad's food consists of injurious forms.

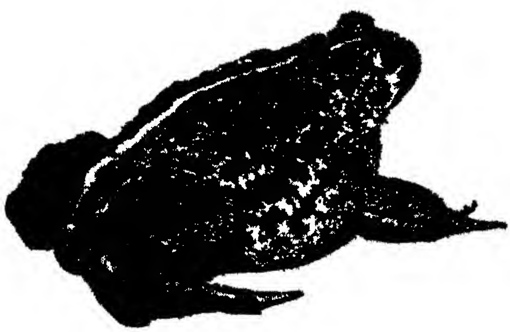

FIG. 234.—Northwestern toad (*Bufo boreas*), the common toad of the Pacific Coast States and the Rocky Mountain region

Toads are not attractive and have always been the basis of curious beliefs and superstitions. In spite of all the absurd prejudices associated with them, they have managed to survive thus far. As the country has become more densely settled, however, toads have had to face new dangers from man's inventions, such as the automobile and the mower and binder and other farm machinery. Great numbers of toads migrating across highways are destroyed each year by automobiles, and the sewer systems of large cities have long taken an annual toll. An active interest in the conservation of toads must be taken if these useful animals are to escape extermination by the draining of their breeding places, by the burning over of fields and woods, and by other perils of their present-day environment.

REMINGTON KELLOGG.

TOBACCO Breeding for Root-Rot Resistance Paying Good Returns The breeding of crop plants for resistance to disease has become one of the most promising fields of endeavor for the control of a number of important plant diseases. Differences in resistance to disease occur within species and varieties of plants in nature, and this resistant character

must be discovered, selected, and generally transferred to other varieties by crossing in order to develop commercial strains of disease-resistant plants. It is, of course, required that disease-resistant strains possess as well all the other characteristics of a desirable commercial variety adapted to the section where grown, and this feature of the work is often most difficult.

Tobacco is subject to about 20 different maladies, but the resistant character is thus far known to exist in the case of only 3 or 4 of these diseases. The most striking examples are those of resistance in tobacco to the black root-rot disease due to the fungus *Thielavia basicola* and resistance to the "black-shank" disease due to the fungus *Phytopthora nicotianae*. The black root-rot disease will serve for present purposes as an illustration of what may be accomplished in this respect. Black root rot, which occurs commonly in all tobacco districts, is usually most serious on land repeatedly grown to tobacco, a practice which is in certain other respects preferable to rotation. The disease is characterized by a decay and depletion of the root system with consequent stunted plant growth.

FIG 235 —Comparative growth of a row of ordinary White Burley tobacco (center) and Standup Resistant white Burley (right) on field infested with root-rot

Growth Much Affected

When the principal types or varieties of commercial tobacco are grown side by side in a soil heavily infested with root rot, remarkable differences in rate and extent of growth appear. Some varieties may make little or no growth, whereas others may make a rapid and normal growth. Between these extremes will be found varieties showing various intermediate stages of growth. These differences in growth are due to relative differences in resistance to the black root-rot disease. Each type of tobacco has a distinct purpose and value of its own, and the varieties naturally more resistant may not be suited to replace the susceptible ones for commercial purposes in the districts where they are grown. Resistant strains, approximately otherwise identical with each susceptible commercial type or variety, must be developed in order to be of any value. As a rule this

can be done only by crossing a resistant variety with the susceptible variety, followed by careful and continued selection and comparison over a period of several years with all desirable characters in mind. It can be safely stated that the requirements of the tobacco trade and grower are probably more exacting than those of any other plant industry. This is chiefly due to the importance of the complicated factor of quality in tobacco. If judgment, patience, and luck have all been favorably combined, the effort of the plant breeder may be rewarded after several years by a desirable disease-resistant commercial strain.

Resistance Could Be Increased

Practically all of the commerical types of tobacco grown in the United States could profitably be improved in their resistance to root rot Up to this time this has been seriously attempted in the

FIG. 236.—Comparative growth of ordinary Havana Seed tobacco (left) and Havana 142 (right) on soil heavily infested with root rot

case of only a few types. In two of these a considerable degree of success has resulted as a consequence of the cooperative efforts of the Bureau of Plant Industry and the Wisconsin Agricultural Experiment Station.

In Wisconsin a Havana Seed type of tobacco is grown, primarily intended for cigar binder purposes. This type, while having an intermediate degree of natural resistance to black root rot, is nevertheless seriously affected by the disease during seasons favorable to its occurrence. The resulting losses may consequently be heavy. Some other varieties of tobacco are grown to a limited extent in Wisconsin, and from one of these a root-rot resistant strain was selected, but its growth habit was not desirable. This strain was, however, crossed with Havana Seed, out of which was finally obtained a strain which was called Havana No. 142. The new type proved to be very resistant to root rot, having considerably more resistance than its most resistant parent. In addition it is a good yielder, has a desirable habit of growth, and so far as has been determined a

desirable quality. It is usually regarded, however, as being a somewhat later maturing strain than Havana Seed. On soil which is infested with root rot the yield and quality is usually strikingly better than that of Havana Seed. The Wisconsin growers have consequently adopted the new strain at a rapid rate, and several thousand acres of this strain are now being grown in the State. A few hundred acres are also being grown in the Connecticut Valley.

White Burley Susceptible

The ordinary White Burley strains of tobacco as grown in Kentucky are extremely susceptible to root rot. Continuous culture of tobacco on the same land is not attempted with these strains. Root-rot resistant strains of White Burley were first secured through field selection, although they had apparently arisen through accidental crosses with resistant varieties. Since these resistant Burley strains did not have the most desirable habit of growth, they were crossed with a good strain of Standup White Burley. From this cross a resistant strain was finally selected which so far as could be observed was desirable as a commercial type. This resistant Standup White Burley strain will ordinarily produce a good crop on land so heavily infested with root rot that ordinary strains may prove a complete failure. While a root-rot resistant type has not been generally adopted in the Burley district of Kentucky, for reasons which can not be discussed in a short paper, it is extensively grown in the Burley district of Ontario, Canada, where root rot is very prevalent.

Although the commercial returns from the root-rot resistant strains already in use have been large, the greatest value of these breeding trials has been in the demonstration of the future possibilities in this direction.

JAMES JOHNSON.

TOBACCO Fertilizer Should Have Ample Supply of Potash It is said that the Indians, who were growing tobacco in this country long before the arrival of Europeans, followed the practice in some localities of felling a tree and burning it in order to obtain ashes for fertilizing their patches of tobacco. Probably they could have done nothing better to insure a healthy, vigorous growth of their tobacco plants in the field and also good smoking qualities in the cured leaf. In a prize essay written by a successful tobacco grower in Maryland in 1848, before the days of modern commercial fertilizers, we read: "Ashes are decidedly superior to any other fertilizer for tobacco. Theory and practice unite in sustaining this assertion." The virtue of ashes as fertilizer, of course, depends primarily on their content of potash. Recent experiments and observations show conclusively the value of a generous supply of potash in the fertilizer for tobacco.

It is true that tobacco plants may attain good size when supplied with only comparatively small quantities of potash, but the leaf produced is likely to be of poor quality and perhaps light in weight. The plant must develop a large leaf area within a short period of time, and potash is an efficient aid in maintaining the health and vigor of the leaf. Without sufficient potash the leaf begins to lose

its normal green color, especially at the tip and along the edges, and soon small specks of dead tissue may appear. The specking may spread rapidly over the leaf, many of the specks uniting to form large spots of dead tissue, and because of uneven growth the leaf surface becomes rough and puckered. The tip and edges of the leaf tend to curve downward, and often the edges become broken and ragged. The quality of the product is greatly injured when these symptoms of potash hunger develop. Evidence of potash hunger commonly begins in the lower leaves of the plant, but may occur on plants of large size, and in this case only one or more of the middle leaves may show the diseased condition.

FIG 237—Tobacco plant in southern Maryland, showing effects of an insufficient supply of potash in the soil The tips and margins of the lower leaves are curved downward in a characteristic manner, the margins are more or less torn and ragged, the leaf surface is rough and puckered, the green color of the affected leaves has largely disappeared, especially at the tips and margins

In the Connecticut Valley where heavy fertilizing is practiced, ample supplies of potash are usually provided in the tobacco fertilizer. In most other sections, and particularly on the lighter sandy soils of southern tobacco-growing districts, experiments indicate that somewhat more potash than is now generally used would give profitable returns. The use of 20 to 30 pounds of potash per acre, quantities which would be supplied by 1,000 pounds of 8–2–2 or 8–3–3 fertilizer, often fails to prevent the symptoms of potash hunger. These symptoms, which are easily recognized, are by no means unusual in tobacco fields where the soil is more or less sandy, and may be seen even on some of the soils of much heavier type used in growing dark air-cured and fire-cured tobaccos.

Even where no symptoms of disease are seen, an increased supply of potash may improve the quality of tobacco. A liberal supply tends to give a smooth leaf of fine texture which "fills out" better in ripening. For smoking purposes good burning qualities are essential, and, other things being equal, the combustibility of the leaf is more or less proportional to its content of potash. In this respect the form of potash used in the fertilizer is of considerable importance. The chlorine contained in muriate of potash under some conditions tends to stimulate the growth of tobacco, but if present in large

proportions it injures the burning qualities of the cured leaf and may even produce injury in the field. For cigar leaf types it seems best to avoid all forms of potash which contain much chlorine. For other types satisfactory results will usually be obtained by using high-grade muriate to supply not more than 20 to 25 pounds of potash per acre, the remainder of the potash to be derived from sulphate or other forms practically free from chlorine.

FIG. 238.—Leaf of tobacco plant, showing effects of potash hunger, particularly the loss of green color which begins at the tip and margins and advances toward the base. Numerous small yellow or brown specks usually appear in the bleached areas, and these tend to grow together, forming large blisters. The dead tissue eventually breaks, forming ragged edges and holes between the veins.

The quantity of potash in the fertilizer required for best results will vary, of course, with the type of soil, the system of cropping followed, and other factors. For average conditions on most of the light tobacco lands, and with normal rates of fertilizing, however, better results probably will be obtained with a minimum of 40 to 60 pounds of potash per acre than with the lower rates now commonly used. It appears that in most cases the potash content of the fertilizer should exceed the content of ammonia by two or more units.

W. W. GARNER.

TOBACCO Grades are Drafted for Leaf Grown in Maryland Maryland tobacco, U. S. type 32, is produced principally in the five counties of southern Maryland which lie between the Potomac River and the Chesapeake Bay. This tobacco is a light air-cured type suitable for use in the manufacture of cigarettes. The desirable qualities for this purpose are thin body, fine texture, a bright, clear color (light reddish tan or cinnamon brown preferable), small and blending fibers, and with a good burn. Maryland tobacco is deficient in so-called oil or gum, and is of a decidedly dry and chaffy character. Because of its desirable color and burning quality, it is extensively used for blending with other less attractive but more aromatic tobaccos to improve their appearance and combustibility.

Tobacco as handled by the farmer fall into four major divisions or groups when assorted by him for the market. They are known in the trade as: (1) Heavy leaf, dark leaf, dull crop, dull, or French tobacco; (2) thin leaf, bright leaf, crop, cigarette, or Holland tobacco; (3) seconds, or lugs; (4) ground leaves, or primings.

About the same lack of care and attention to proper assorting is prevalent in Maryland as in many other tobacco-growing sections. Leaves of different quality and color are tied into the same hands or bundles, and tobacco of different quality is mixed in the hogsheads or packages. There are clear lines of distinction between the four major groups and in most instances a crop of tobacco contains some leaves of each group, but there are many farmers who make only two group divisions, calling them "crop" and "seconds." This practice is undesirable and results in mixed lots. Through the application of standard grades farmers can be taught the disadvantages of such assorting.

The Department of Agriculture has devoted a great deal of time and effort to the study of Maryland tobacco. Recently, tentative standard grades have been drafted using the department standard system of grading as a basis. Under this standard system, a grade of tobacco is treated as being composed of four factors—group, quality, color, and length. Symbols of letters and numerals are used to indicate these factors.

In working out the grades for Maryland tobacco the accepted trade distinctions as to groups are closely followed. The four major divisions or groups are considered and distinguished as follows: B, heavy leaf; C, thin leaf; X, seconds, and Y, ground leaves. Quality is indicated by numerals running from 1 to 7. The colors appearing are: L, yellow; F, light red; R, dark red; D, dark brown; G, green, and M, mixed. Length is treated as an element of quality in all grades except the tip leaf grades, and for these the United States standard sizes are used to indicate length. A total of 44 grades is considered necessary to cover the entire range of grades that appear in the crop.

In a bulletin prepared by the department the standard grading system and the grade symbols used are fully explained, definitions are given of tobacco trade terms, certain rules are laid down as to the application of the grades, and the grades are listed with detailed descriptions and specifications.

Advantages of Grading Maryland Tobacco

The advantages to be derived from the application of standard grades to Maryland tobacco are set forth in the following summary. The use of standard grades for tobacco should—

(1) Bring about a more uniform market for tobacco of like quality, color, and length.

(2) Encourage growers in the production of better quality tobacco.

(3) Give the growers a more definite basis for assorting tobacco and demonstrate the value of proper assorting.

(4) Enable the growers to become familiar with the grades that are in most demand so they can plan to produce tobacco that will meet market requirements.

(5) Promote a closer cooperation and better understanding between the growers, commission men, and buyers.

(6) Enable buyers and manufacturers to secure a more uniform packing of tobacco as the result of more careful assorting by the growers.

(7) Give to the tobacco trade generally a common language which will facilitate the transaction of business.

To secure these results an educational campaign should be conducted among the tobacco farmers of Maryland. For such a campaign, bulletins stressing the importance of proper assorting and copies of the proposed grades should be liberally distributed. Demonstrations of proper assorting and grading should be conducted at representative points. Supplementing such an educational campaign a practical application of the grades at the marketing point is of vital importance.

When the grades are applied by the trade the farmers grasp much more easily and quickly the finer lines of distinction. The marketing system in Maryland lends itself admirably to this purpose. The fact that the entire crop of Maryland tobacco is marketed through two warehouses will simplify the application of the grades in trade channels.

The tobacco is marketed in hogshead form and each hogshead is sampled and inspected under authority of State laws. A competent and experienced tobacco man should be appointed as an official grader for each warehouse, and as each sample is drawn an official standard grade should be assigned to each hogshead. This grade could appear on the official sample tag and on the hogshead, or on the warehouse receipt issued, or an official grade certificate could be issued. If official grade certificates are used they should be issued in triplicate, one copy to be retained for the warehouse files, one copy to be sent to the farmer, and the original to follow the tobacco as it goes through trade channels.

If the Maryland tobacco were so inspected and graded each farmer would have a basis for comparing prices received for his tobacco with those received by other farmers for tobacco of like quality, color, and length.

J. V. Morrow.

TOMATO Losses from Center Rot Heavy in Several States

Green tomatoes ready for shipping long distances and ripe ones for near-by markets may be affected by a hard dark center rot but show it very slightly on their surfaces. At market inspection, should the keen eye of the inspector find an inconspicuous dark ring or tiny brown spots around the stem end, he knows this is an indication of a hard dark brown center (fig. 239). And so hundreds of bushels of tomatoes which looked sound to the grower at shipment may be discarded because of this center rot. Heavy losses from the disease have occurred in Nebraska, Texas, Michigan, and Maryland.

There is no slime or softness connected with the rot. The hard dark portion may extend from the stem through the center to the blossom end or part way there, or it may take an oblique course from the stem, involving some of the seeds. The leaves and stem of the plant are not affected.

A yellow bacterial organism was found to be a very active agent in producing the disease, and for some time it was thought to be the specific cause. Later other yellow organisms from the same diseased fruit were found just as infectious as the first type. This fact was perplexing until inoculations were made with various well-known organisms. From these experiments it was established that a fair

number of different bacteria and fungi could produce the typical hard dark centers in tomatoes.

The disease seems to be sporadic. It occurs in hot moist weather following a time when growth has been retarded from cold or drought. The organisms probably enter at the stem end, where the cuticle ends and the stem begins, and work inward. They may gain an entrance at any stage of the developing green fruit.

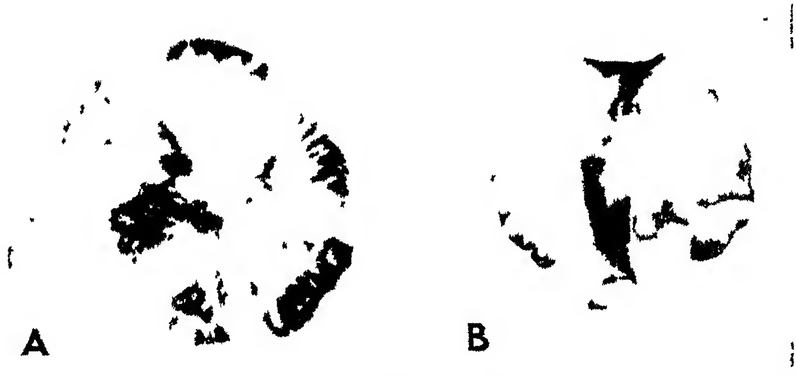

FIG 239—The hard dark center rot of tomatoes showing in green fruit

The best preventive measure is to keep the plants well cultivated, so there will be a steady even growth. Then no sudden rapid swelling of fruit is apt to occur. It is this rapid swelling which gives rise to tiny fissures around the stem end, making entrance places for bacteria and fungi.

NELLIE A. BROWN.

TOMATOES Resistant to Nailhead Rust Now Widely Planted

Nailhead rust of the tomato is characterized by brown to olive-gray spots, about the size and shape of an average-sized nailhead, on stems, leaves, and fruits. (Fig. 240.) Death of the leaves and scabby blotches on the fruits accompany these symptoms when the spots become numerous. The disfigurement of the fruits makes them unsalable.

Nailhead rust is caused by a fungus—a very minute, threadlike plant similar to the molds that grow on bread, pie, cake, meat, leather, etc. It is too small to be seen without the aid of a lens or microscope except when growing in mass, as on the surface of nailhead spots or culture media.

The nailhead rust fungus forms numerous small reproductive bodies called spores. These spores (the equivalent of seeds) germinate under favorable conditions of temperature and moisture and produce the branched threads or filaments of the fungus.

The filaments grow either on dead plant materials (chiefly remains of previous crops) lying on the surface of the soil or in living tomato plants. They penetrate the plants either by means of enzymes, which decompose the tissues at the point of contact, or by growing through small pores in the surface layer. When inside the plant

they attack and kill the immediately surrounding tissues. These dead areas constitute the spots or symptoms of the disease.

Nailhead rust is very common in the Gulf States, in South Carolina, and in the Sinaloa district of Mexico. It occurs sparingly in the region bordering the States mentioned and is found occasionally farther north, but usually causes little damage in the latter area. It has often been carried into the canning States of the North on southern-grown tomato plants, but has apparently been unable to establish itself in these States.

FIG. 240.—Nailhead rust of tomato

Economic Importance of Nailhead Rust

Nailhead rust has caused an average loss of about 25 per cent of the crop, amounting to $2,500,000 to $3,000,000 annually in Florida for at least one or two decades. It has also caused considerable loss in Texas, Louisiana, Mississippi, and South Carolina. It has also been very severe in Mexico. In fact, the tomato industry of both Florida and Mexico has been seriously threatened by this disease.

Several methods of nailhead-rust control have been tried repeatedly by experimenters and growers. Spraying or dusting the plants with fungicides gave some promise, but growers were unwilling to adopt it because of the cost of chemicals and labor and the uncertainty of results. Investigations now being conducted by the Florida Agricultural Experiment Station, however, may ultimately lead to a more efficient method of spray control for this disease.

The use of a resistant variety is the ideal method for the control of nailhead rust, as it requires no additional expense or labor except for picking and handling the extra fruit. The new Marglobe variety (fig. 241), developed at the Arlington Experiment Farm, near Washington, D. C., was produced for this very purpose and has given excellent results in southeastern Florida in three years' tests conducted by the Bureau of Plant Industry and the Florida Agricultural Experiment Station, in cooperation with the Dade County Commissioners

and commercial growers. It has also given similar results in large commercial plantings in Florida and other Gulf States and in Mexico. In fact, it has apparently solved the most difficult phases of the nail-head-rust problem. A brief description of its origin and suitability for shipping is pertinent.

Origin of the Marglobe

The Marglobe was developed from a cross between Marvel and Globe. In a two years' test of more than 100 varieties for nailhead-rust resistance, Marvel and Globe seemed to offer the best possibilities for the development of a resistant variety of the desired type.

Marvel was chosen as one of the parents because of its free and continuous fruit-setting habit, long bearing period, high degree of resistance to Fusarium wilt and nailhead rust, and partial resistance

FIG 241—A typical Marglobe plant, showing type of fruit and fruiting habit Only part of the plant is shown, and the foliage is pressed down to show fruits

to Septoria leaf spot, early blight, and leaf mold. Although its fruits are smooth, uniformly red, and well flavored, they are a little small, somewhat flat, rather late in maturity, and less meaty than desirable for a shipping tomato.

Globe was selected as the other parent because it produces large, thick-walled, globular fruits and possesses considerable resistance to most foliage diseases, although very susceptible to nailhead rust of fruits.

The Marglobe is rapidly supplanting the Globe in Florida and other trucking regions. It is much superior to the Globe in resistance to nailhead rust, Fusarium wilt, and puffiness of fruits—diseases common and destructive in the Gulf States.

The Marglobe is an early and continuous bearer; in fact, it not uncommonly makes from 8 to 12 pickings during the winter in Florida, and on the heavy, fertile soils of the North it usually con-

tinues to bear until killed by frost. Although its fruits mature quickly, they ripen slowly and therefore withstand delays in picking and prolonged periods of shipping and storing. This is important during bad weather or temporary periods of heavy shipments and low prices.

The fruits of Marglobe are smooth, solid, globular, and comparatively free from undesirable types. They are packed chiefly in the 120 and 144 grades, the most desirable sizes for shipping in Florida. If picked when mature green, they ripen well, even around the stem, and develop a very good flavor

Approved By Shippers and Growers

The Marglobe has won the hearty approval of growers and shippers. At many shipping points in Florida buyers have frequently paid more for Marglobe fruits than for the same commercial grades of Globe.

Approximately 10,000 acres of Marglobe were grown in Dade County, Fla., in the winter of 1926–27. A considerable acreage was also grown in Mexico. Extensive plantings were also made in the other principal trucking regions and in most of the commercial canning regions of the United States. In these areas it has resisted diseases well, especially Fusarium wilt, Septoria leaf spot, early blight, leaf mold, and nailhead rust, and has produced heavy yields of excellent fruit; in fact, it has given highly satisfactory results. Its resistance to nailhead rust is therefore only one of its many desirable qualities.

Marglobe seed is now produced in large quantities by commercial seed growers, canners, and canners and packers' organizations, and is sold by nearly all the principal seedsmen.

FRED J. PRITCHARD.

TREE Giants in the Sequoia Groves are Menaced by Tourists

Among the wonders of the world the enormous "Big Trees" or Sequoias of the Sierra Nevadas in California surely stand in the first rank. Several large groves have been included in national parks and are strictly protected by the Government.

When these groves were set aside and protected from commercial exploitation for the use and enjoyment of the public the means of approach were few and primitive. The groves lie in the heart of the Sierra Nevadas at elevations between 5,600 and 7,000 feet. The mountain roads then in existence attracted only a small number of tourists. The majority passed through, content with a short visit.

The advent of the automobile and of good roads has changed all this. To-day tourists pour into the groves by the hundreds and thousands, and with them has come a serious menace to the chief attraction of the groves, the Big Trees themselves.

The visiting public naturally singles out those trees which, on account of their enormous size and their hoary age, appeal most strongly to its imagination. People like to come up close to the trees and to touch them with their hands. There is a peculiar attraction in camping under the shade and protection of huge trees 2,000 or 3,000 years old.

All this involves in the aggregate an enormous amount of walking and, consequently, trampling around the trees singled out by the tourists. As a consequence, the surface of the soil, especially of moist and heavy soil, is compacted to a tough and impermeable sheet. Where formerly young trees, shrubs, perennial and annual flowering plants, ferns, and grasses played their part in the beauty of the forest, and by their shade kept the soil fresh and cool, not a living plant is left. The Grizzly Giant (fig. 242), one of the oldest trees in existence, is now surrounded by an artificial desert of more than an acre in extent. These changes are not merely undesirable because they detract from the beauty of the forest, but they have a profound influence upon the soil itself and upon the conditions under which the tree roots function.

FIG. 242.—The Grizzly Giant, one of the oldest trees in existence, is surrounded by a desert of more than an acre in extent, due to excessive tourist travel. Photograph by James V. Lloyd, courtesy of the National Park Service of the Department of the Interior

The root system is one of the most vitally important parts of the plant. Unless it functions normally, the crown with its foliage can not be supplied with the large quantities of water required. The water is taken up exclusively by the finest endings of the roots. In the Big Trees, these are practically confined to the upper soil layer of a few inches in thickness, which, under normal forest conditions, is filled with a richly felted mass of rootlets with numerous water-absorbing root endings.

Wherever trampling has been going on for years, this soil layer contains a much reduced number of rootlets and the root endings are either poorly developed or dead. This means just one thing, namely, that the tree is bereft of the very organs with which alone it can procure the water indispensable for its life.

It is little short of miraculous that the large Sequoias, handicapped as they are by extreme old age, are still surviving, though in certain instances a decline is already noticeable. This is particularly appar-

ent in old trees which have suffered heavily from forest fires in the past. There are few of the larger trees which do not show more or less severe burns at the base, so that only a portion of the circumference of the tree actually takes care of the interchange of water and foodstuffs between root system and crown. The normal balance between the two is disturbed, and the process of readjustment is a long and slow one. It may take centuries to heal over a large fire scar. During this time the tree is under the handicap of a severe setback.

Unfortunately the heaviest traffic, and therefore the heaviest trampling, concentrates around the oldest trees which are still in the process of slow recovery from fire injury. While undoubtedly Big Tree is one of the most resistant and long-lived tree species known, the final result can not be in doubt. Sooner or later the trees, having lost the greater part of the water-absorbing root endings, will show signs of distress and will finally no longer be able to withstand the combination of extreme old age, fire injuries, and tourist trampling. Realizing the existing menace, the National Park Service is taking energetic steps to prevent further damage and, if possible, to bring conditions back to normal.

It is a curious fact that the public, in whose interest the venerable giants were placed under careful protection, is unwittingly hastening the destruction of one of the greatest marvels not only of this country but of the world.

E. P. Meinecke.

TREE Growth Retarded by Fires; Young Trees Killed, Soil Depleted Woods fires kill many trees outright, and they lead to other damage often serious enough in the long run to turn timber growing profit into loss. By making wounds in the living tissues of trees fires open up fertile fields for the growth of rot-producing fungi, which hollow out the trees and make them defective and easily thrown by a strong wind. By weakening the trees fires make them more susceptible to attack by insects which often cause their death. And by burning fire scars or cat faces on the trunk each fire gives the next a better chance to burn down the trees. When the logger comes along to take out the timber, he passes up the defective, dead, and down timber as valueless.

Fires destroy tree seeds and kill the baby trees, causing blank spaces in the woods or idle land on which there is little or no tree growth. Repeated fires often kill trees of desirable kinds, whose places are taken by inferior fire-resistant trees or by brush. Thus the land is either rendered absolutely barren or made unproductive in spots. On burned-over land desirable trees are often conspicuous by their absence. Their removal from the stand represents the loss of that part of the crop which often makes the difference between profit and loss in timber growing.

Effect of Impoverished Soils

Where the country is burned over repeatedly, the trees do not grow so rapidly as they would otherwise. Impoverished soils un-

questionably are partly responsible. The injurious effects are especially apparent in the case of young pine timber. In one instance careful investigation showed that young long-leaf pine trees grew 2.8 times faster in height on unburned land than they did on an area

FIG. 243.—The land to the left of the fence was protected against fire for 20 years by the plowed fire line. To the right of the fire line fires occurred nearly every year. The burned land has 136 trees per acre, the unburned land 1,800 trees per acre. Surviving trees on the burned ground show about one-half the diameter growth of those on the unburned or protected ground

burned over annually. Under similar conditions the diameter growth for shortleaf pine was found to be three times greater for the trees that grew on unburned land. These contrasts in height and diameter growth are brought out clearly in Figures 244 and 245.

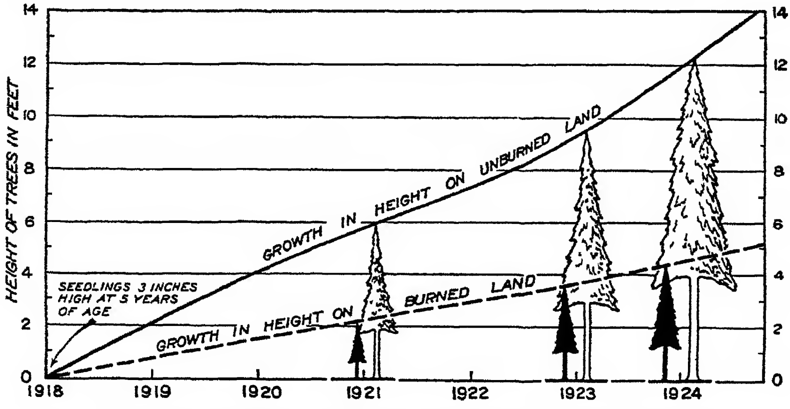

FIG. 244.—Comparative height growth of young long-leaf pine on burned and unburned land

Comparative growth as shown in the illustrations is for extreme conditions—repeated or annual burning on the one hand and no fires at all on the other. Under infrequent burning the contrast would not be so pronounced, nor are the examples used applicable to all situations, types of trees, and regions. It is clear, however, that

fires usually retard tree growth appreciably thereby affecting adversely the revenue ultimately derived from established stands of young timber.

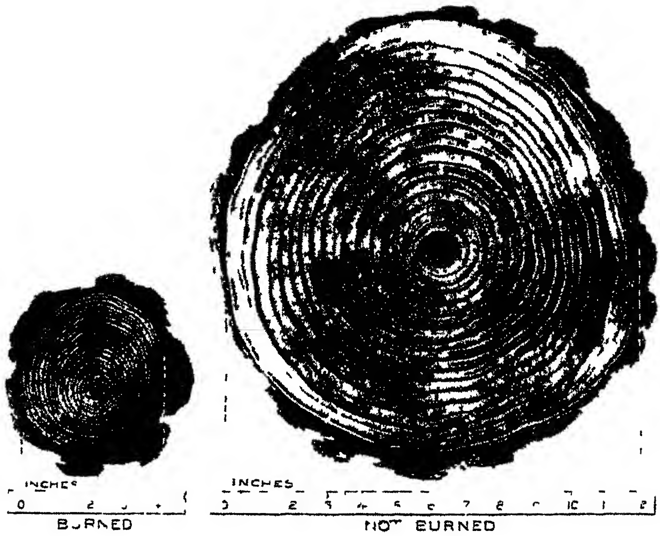

FIG. 245.—Comparative diameter growth of short-leaf pine on burned and unburned land Both trees are about the same age and were grown within a few yards of each other on opposite sides of the road. Factors influencing growth were similar except for fire The land on which the smaller tree grew was burned practically every year, while that on which the large tree grew had not been burned

In the long run these insidious losses—rot, insect damage, destroyed baby trees and retarded tree growth—often represent a greater loss to the owner than the more spectacular damage in killed timber observed immediately after a severe fire.

HARRY LEE BAKER.

TREE-NURSERY Methods for Southern Pines for Farm Planting Within the range of the four principal species of southern pine—long-leaf, slash, loblolly, and short-leaf—there are at least 10,000,000 acres in need of forest planting. This land is too poor or too steep for cultivation and in many places it includes badly washed and eroded areas. Much of it is owned by farmers who, since a stand of pine will greatly increase its value, can often advantageously raise pine seedlings with which to reforest it.

Good seed, the right kind of seed bed, proper sowing of the seed, plenty of water, protection from birds and animals, and careful weeding, are necessary for the production of good nursery stock. Southern pine seed, especially long-leaf seed, does not keep well and must be sown not later than the first spring after collection, and southern pine seedlings, especially in the South Atlantic States and the Gulf coastal plains, usually become large enough for field planting within a year, and therefore do not need to be transplanted in the nursery.

Fresh Seed Essential

Fresh seed is essential It may sometimes be bought from seed dealers or obtained from State foresters, but collecting it from the trees is usually more satisfactory. The seeds are produced between the scales of the pine cones, or burrs, and ripen during September and October. Care must be taken to collect the cones before they are too ripe, or the scales will separate and the seeds fall out and blow away. Usually the cones turn slightly dry and brown just before opening. They can be collected from standing trees or from trees felled in logging operations. Healthy, thrifty trees should be chosen.

The cones are opened by drying in a layer one cone deep on some smooth surface, or on a wire rack with cloth underneath it, in the sun or in a warm, dry room. (Fig. 246.) Drying takes from a week to a month or more, depending on the kind of seed and on the weather.

FIG 246—Loblolly pine cones drying in the sun on wire and burlap racks a few inches above the ground During rain and at night the cones are covered with canvas to keep them dry

A bushel of cones should yield a pound or a pound and a half of seed, which is removed by stirring or tumbling the cones in a box. When thoroughly dry the seed can safely be stored in sacks, boxes, glass jars, or tin cans. Care must be taken to keep it from mice. Seed the least bit moist spoils quickly in a closed container.

All pine seeds have wings. The wings of long-leaf can not be removed, but those of the other species are easily cleaned off by rubbing the seed between the hands and winnowing in a stiff breeze. Cleaned seed is easier to sow.

Seed beds should be on sandy or loamy rather than on clay soil. A bed 4 by 12 feet will hold from 1,500 to 3,000 seedlings. It is usually necessary to protect the bed (fig. 247) from birds and mice by a fence of ½-inch or smaller wire mesh running a few inches below the ground and extending 12 inches above and supported by stakes and light wooden rails, with removable screens of the same wire on top. The soil in the bed must be spaded thoroughly and raked smooth and level before sowing.

Early Spring Sowing Best

Early spring sowing seems to be more generally satisfactory than fall sowing. Seed may be put in early in March in the southernmost States, and progressively later toward the north. It may be broadcast evenly all over the bed or sown in drills about 6 inches apart. The broadcasting is quicker and makes better use of the soil, but the drills make weeding easier later on. The seed should never be covered more than one-eighth to one-fourth inch deep with sand or soil, and may more easily be covered with a single layer of burlap sacking. The bed must be well watered after sowing. The burlap must be removed as soon as the seed has sprouted well.

FIG 247 —Loblolly slash, and long-leaf pine seedlings, 3 months old and properly thinned Note removable wire screen over bed

Long-leaf pine seedlings should not stand closer than 30 or 40 to the square foot in a broadcast bed, or 10 to the running foot of drill. The corresponding numbers for slash pine and loblolly pine are 50 to 60 broadcast and 15 in drills; for short-leaf pine, 70 broadcast and 18 in drills. Seedlings surviving the first six weeks or so in greater densities must be thinned out or slow growth, injury, and death will result. Thinnings should not be made until seedlings are nearly 6 weeks old and past the stage at which the greatest loss generally occurs.

Long-leaf pine seeds, with the wings on, usually run about 5,000 seeds to the pound; the cleaned seeds of slash pine run about 15,000 to the pound; those of loblolly pine about 20,000; and those of short-leaf pine about 50,000. The exact amount of seed to be sown can be determined approximately from these figures, counting on about half of the seeds to produce trees, or can be judged by eye closely enough for the small nursery.

Seed Beds Need Watering

Pine seed beds must be kept well watered. Ordinarily rains will be sufficient, but in dry spells during the spring and summer a 4 by 12 foot bed, especially if it shows any signs of suffering from drought, should have 4 or 5 pails of water poured or sprinkled on it very carefully every few days. If enough water is not available, the bed may be shaded with strips of lath tacked an inch or two apart on a wooden frame a foot or a foot and a half above the bed. Such shade should be left off in wet or cloudy weather, and should not be used after July. Southern Pines except possibly short-leaf, need no shade at all if properly watered.

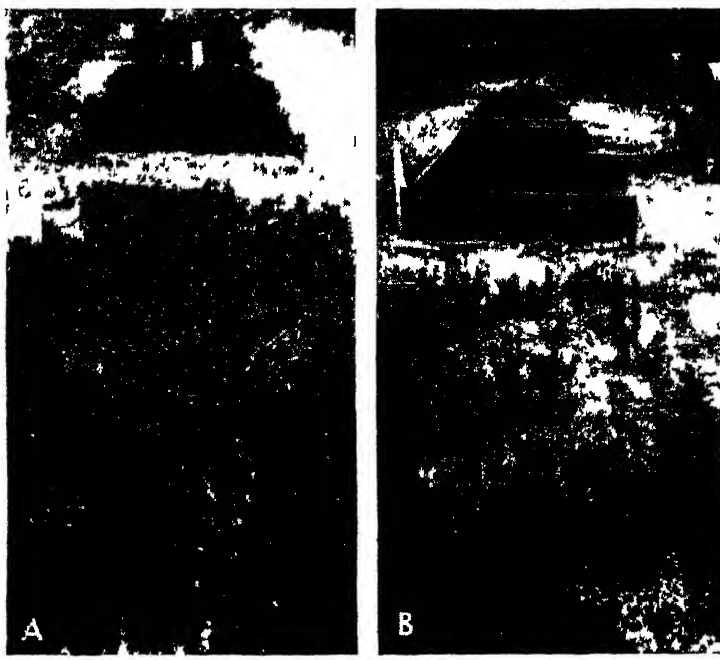

FIG. 248 —Pine seed beds 1 year old, treated alike except that the one at A was weeded carefully all summer and the one at B was not weeded until the end of the growing season Note the superiority of the properly weeded bed

Seed beds must be kept weeded. The smaller the weeds when pulled the better for the seedlings and the easier, in the long run, is the task of keeping the beds clean. (Fig. 248.)

Of the various injuries affecting pine nursery stock, that caused by damping off is usually the most serious. This disease kills seedlings from the time the seeds first sprout until vigorous growth is under way and larger needles develop above the original seed leaves, usually a month or six weeks later. The disease is most dangerous in wet weather and long-leaf pine is especially apt to be damaged. The seedlings discolor and wilt suddenly, or simply fall over; and on examination the roots are found to be watery or brownish, and often actually rotting away. If the disease is discovered watering should be stopped and all shade removed. Sprinkling the bed with an eighth of an inch of pure sand has sometimes checked the trouble.

Effects of Heat and Drought

Injuries by heat and drought are usually easily recognized, especially since they come during dry, hot weather after danger of damping off is past. Growth is poor, seedlings become yellowish and finally turn brown and die, and in the worst cases of heat injury, actual scars on the tender stems at the surface of the ground cause the seedlings to fall over. The remedies are increased water and partial shade.

Insects are usually not a serious source of danger to pine seedlings. The hardest to control are white grubs, which eat off the roots underground and cause the seedlings to turn reddish brown and die. All such grubs found when spading the bed should be picked out and killed. Other insects sometimes eat the leaves, and can generally be controlled by using any of the ordinary insect sprays according to the directions on the package.

PHILIP C. WAKELEY.

TREE Planting for Memorial Purposes a Growing Custom

It has become the custom, if not the style, to plant a tree or number of trees in commemoration of some person or event of particular importance. Such planting has long been done by schools in celebration of Arbor Day. In recent years clubs and other organizations have taken up the idea. Thousands of trees have been planted for memorial and other purposes by the Federated Women's Clubs alone, not to mention the planting by D. A. R. chapters, Boy Scouts, Girl Scouts, and similar organizations. During 1927 the Camp Fire Girls set out many trees as part of their celebration of "Tree year in Camp Fire." The boys and girls attending the first national Four-H Club Camp in Washington planted a hemlock in the grounds of the Department of Agriculture to commemorate their encampment. (Fig. 249.)

Most of the planting of trees for special purposes is accompanied by a program prepared for the occasion. This program may be simple or elaborate as the opportunity affords. The main feature is the tree planting. In addition there may be an appropriate address, recitations, and readings. An invocation by a local clergyman will add impressiveness, as will also a charge of responsibility to the custodians of the tree (or trees) and a tree-planter's pledge. If there is sufficient time to make the necessary preparations, a pageant is a very attractive and colorful form for the ceremony to take. (Fig. 250.) Music is always a pleasing addition, and ensemble singing enables all attending to participate in the exercises.

While the program may deal principally with the reason for planting a tree, it affords opportunity to bring to local attention other ideas, such as need for tree planting, the care of trees, and their usefulness to mankind. This also gives a chance to stress other forestry points of particular importance to the locality, or the State, or even the country at large.

Program Suited to Various Purposes

The program can be adapted to numerous purposes and can be employed to good advantage by the teacher and the county agent.

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FIG 249—Planting eastern hemlock to commemorate the first Four H Club encampment Grounds of the Department of Agriculture, Washington, D C

FIG 250—A pageant in an outdoor setting can be extremely interesting and attractive

The teacher can use it in celebration of Arbor Day and American Forest Week, and afterwards can utilize the planted tree to demonstrate outdoor nature work. The county agent can adapt it to meetings of farmers, farm women, and boys' and girls' clubs, and thereby put across some good lessons in farm forestry. Helpful material for making up tree-planting programs can be obtained from most of the State forestry departments, the Federal Forest Service, and such other sources as the American Forestry Association and the American Tree Association.

The tree-planting celebration has a sentimental appeal and a practical purpose. By reason of its sentiment it fixes in the mind the importance of the objective To see a tree planted is a commonplace occurrence, but to see a tree planted for a special purpose and with appropriate ceremony makes that tree a thing of interest to focus attention on all trees and our need for them.

Suggested Outline for Tree Planting Program

Invocation (by a local clergyman); ensemble singing; recitation; tree planting (by planting crew of four or more); address (by speaker of the day); song (solo or quartet); reading; ensemble singing.

MARIE FOOTE HEISLEY.

TREE Planting in Pine Region of South; How and When to Plant

The constant increase in value of second growth timber, the rapid growth of long-leaf, slash, loblolly, and short-leaf pines, and the early age at which they produce pulp wood, saw logs, and other products, all combine to make a stand of young pine in the South an excellent

FIG 251 —Lifting and bundling year-old pine nursery stock The roots are cut off cleanly 8 inches underground by means of the shovel, which is sharpened with a file

investment. Fortunately, if a small acreage of waste land gives no promise of reforesting itself from near-by seed trees, it is comparatively easy to reforest it by planting.

The safest rule in choosing the kind of tree to plant is to take the one which previously grew on the area, or which grows on similar areas nearby. In general, shortleaf and loblolly pines are more apt to grow mixed with hardwoods than are long-leaf and slash pines Long-leaf does well on heavier clays and on drier ground than any of the other pines; slash requires the most water; and the loblolly seems to need both fertile soil and plenty of water throughout most of its range.

Planting year-old seedlings (fig. 251) has proved more successful than sowing seed. Sowing has produced abundant trees in a few instances, but in many others has failed, often because birds ate the seed. Furthermore, trees produced by direct seeding are less evenly spaced and more apt to interfere with each other's growth than are planted trees

FIG. 252—Planting in plowed furrow with dibble First stage, making the slit

FIG 253—Dibble planting Second stage, setting year-old seedling in the slit

Spacing Varies with Soils

On good ground a satisfactory spacing is 6 by 8 feet (about 900 to the acre) or even 8 by 8 feet (about 680 to the acre). On poorer sites a spacing of 6 by 6 feet (1,210 to the acre) is better, because it allows for losses. Except in heavy brush it usually pays to plow a shallow furrow every 6 or 8 feet, running across the slopes. This gets rid of grass, which otherwise not only makes planting harder but sometimes crowds out the pines. A middle burster makes a better furrow than a turning plow.

Planting should always be done during as wet weather as possible, and always between the end of active growth in the fall and the beginning of new growth in the spring. In the Gulf and Southern Atlantic States the planting season usually extends through November, December, and January. In the northernmost part of the southern pine region frost divides the season in two parts, of which the spring is probably the better.

Although successful plantations have occasionally been made with self-sown seedlings very carefully dug up in the woods or old fields, nursery-grown seedlings are greatly to be preferred. Nursery stock

FIG 254 —Dibbel planting Third stage, starting to close the slit by driving the dibble in at an angle about 4 inches away, with the handle held fairly high

FIG 255 —Dibble planting Fourth stage, closing the bottom of slit by prying down on the dibble handle to force the blade up

can frequently be obtained from State foresters, and it can easily be raised by the planter himself. Southern pine seedlings are usually large enough for field planting when one year old.

Roots longer than 8 inches should be cut off with a sharpened shovel in the process of lifting from the bed, or with a knife after lifting.

Roots Must Be Kept Moist

In lifting and handling stock in the nursery, as well as in planting it in the field, the utmost care must be taken to keep the roots moist all the time. The seedlings must be handled rapidly and kept watered and out of the sun as much as possible. While waiting to be wrapped

they must be covered with wet sacks or a layer of moist soil, and for transportation must be packed in some material like wet bog (sphagnum) moss. Seedlings are usually transported in bundles of 50 to 75, wrapped in burlap or heavy paper. They may be planted directly from the bundle if sufficient care is used to keep them wet and not to break the roots. The usual method, however, is to carry them in a pail containing a few inches of mud and water.

If seedlings must be held over for any length of time at the planting site they should be spread out and heeled in against the sloping side of a shallow trench, their tops sticking out and their roots well covered by thoroughly packed and watered earth. The trench should be in a shady place.

FIG. 256.—Dibble planting Fifth stage, closing the top of the slit by a firm thrust of the heel

For planting with a dibble furrows are especially necessary. Two men or a man and a boy are needed to do the work. One man makes a slit for the seedling, by a downward stroke of the dibble in the furrow (fig. 252); the other inserts the seedling in the slit (fig. 253); and the first closes the bottom of the slit by driving in the dibble, on a slant, about 4 inches away, and prying down (not up) on the handle (fig. 254). The top of the slit is closed by a slight upward motion of the dibble, followed by a thrust from the planter's heel. (Fig. 256.) It is important to make the first slit with one or more straight downward strokes, not by inserting the dibble in the ground and then pushing its handle back and forth. Pushing back and forth makes the bottom of the slit so large that it can hardly be closed, with the result that the roots dry out and the seedling dies.

Grub Hoe Used for Planting

The mattock or grub hoe is ordinarily used in planting where the dibble is not available, where brush prevents the plowing of furrows, or where the soil is stony. It can be used by a man working alone. It is generally used in the so-called hole method of planting. This consists simply of digging a hole slightly larger than the root system of the seedling, holding the seedling in it with one hand and filling in the earth with the other. The earth should be packed several times with the hands as the hole is being filled. On land not prepared by furrowing, it is well to clear away the sod or other cover on a square foot or so before making the hole.

In planting any species, care must be used to spread the roots out as naturally as possible, and especially to avoid doubling them up. Long-leaf pine seedlings, which form no stem the first two or three

years, should be set about half an inch higher in the field than they grew in the nursery, to prevent soil from washing in and covering the buds. Other species should be set as they stood in the nursery.

All plantations must be carefully protected from fire, and long-leaf pine plantations must be very carefully protected from hogs.

PHILIP C. WAKELEY.

TREE-SEED Flight Measured as Aid in Reforestation

In growing a timber crop it is desirable to avoid the heavy initial cost of planting the trees by providing a seed supply for natural regeneration. The seed may come from adjoining bodies of green timber, from cull trees left in logging, from occasional blocks of timber the logging of which is delayed, or from seed trees left singly or in groups as on the national forests.

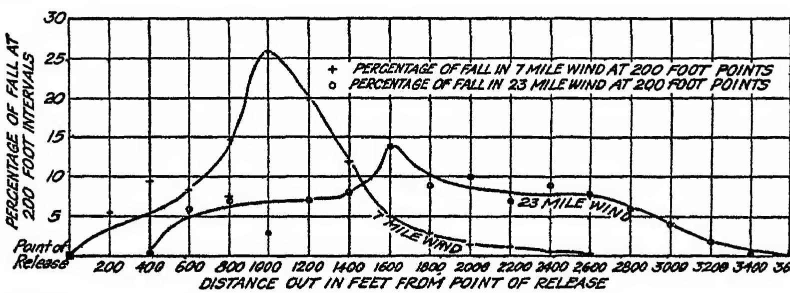

FIG. 257.—Curve showing distribution of Douglas fir seed when released at a 200-foot elevation during winds of 7 miles, and of 23 miles per hour. Each point represents the percentage of the total amount of seed that fell within 100 feet on either side of point

In order to decide where to leave seed trees or bodies of green timber for reseeding cut-over areas it is necessary to know how far the seed is carried by the wind. This information was obtained last winter in a rather novel manner by the Pacific Northwest Forest Experiment Station of the Forest Service. By means of a large box kite winged seed were liberated at a height of 200 feet, the average height of Douglas fir trees, over level snow fields in winds of different velocities. As the seed settled to the earth after each release it was collected at 200-foot intervals to determine the distance and density of fall. Douglas fir, western white pine, western yellow pine, noble fir, western hemlock, and western red cedar seeds were released.

Seventeen Tests Made

Seventeen separate tests were made in winds that varied from 7 to 23 miles per hour, and a total of over 4,000,000 seeds were used. Figure 257 shows the distribution of Douglas fir seed in the lowest and highest wind velocity. In the 7-mile-per-hour wind the seeds fell in greatest abundance at 1,000 feet from the point of release, and the greatest distance at which seed was found was 2,600 feet. In the 23-mile wind the greatest density of fall was at 1,600 feet and the extreme distance was 3,600 feet. Seed distribution at intervening wind velocities fell quite proportionately between these two.

The seed of western hemlock and western white pine made a slightly greater flight, and the seed of western red cedar, noble fir,

FIG 258—Winged forest tree seed used in tests to determine distance that such seed could fly in winds of different intensities A, Western red cedar, B, Douglas fir, C, western white pine, D, western yellow pine, E, Noble fir F, western hemlock

and western yellow pine a slightly lesser flight than that of Douglas fir (Fig 258)

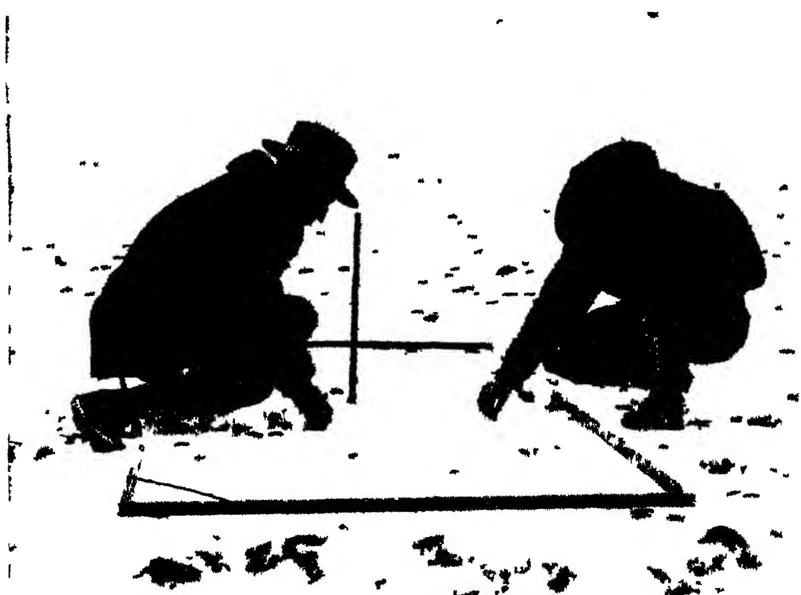

FIG 259—Counting forest tree seed on a 4 by 8 foot plot to test distance that seed is carried by the wind over a snow field from point of release

Quantity of Seed the Important Factor

The experiments showed quite conclusively that, because of the distance the seeds travel, close and regular spacing of seed trees is not

essential for uniform dissemination. The question is more one of quantity of seed than of distribution of seed trees. An abundant seed crop of Douglas fir occurs approximately every fourth year with about two light crops and one complete failure intervening. During the lean years there seems to be little surplus seed for reproduction over and above the natural loss by decay and by bird and rodent consumption. Seed from a single tree may be sown over approximately 80 acres, but experience indicates that a single seed tree is not likely to produce, even through a term of years, enough seed to reforest thoroughly and effectively more than a fraction of an acre. Therefore, though the distribution of seed trees need not be regular, a goodly number must be left.

L. A. ISAAC.

TREES for Turpentine and Timber May Pay on Poor Crop Land In the southeastern coastal plain there are likely to be found, even on the best farms, rough or swampy creek bottoms or dry, sandy ridges where ordinary farm crops will not thrive. In such places the slash or the long-leaf pine, protected from fire, can as a rule grow rapidly and take

FIG 260—Long-leaf and slash pines are the crops best suited to certain tracts of and on many a southern farm

its place with the other farm crops as a revenue producer. Such a crop can be grown and harvested with less annual labor than field crops and can be attended to at seasons when other farm work is slack.

A few trees already on the site will seed it naturally if fire is kept out. In case seed trees are not present, the area can be stocked with slash or long-leaf pines by planting seedlings. With very little care, other than protection from fire and an improvement thinning every few years, a producing stand of pines may be grown in from 15 to 30 years.

FIG 261 —Don t kill the goose that lays the golden egg by working trees which are too young and small (below 10 inches breast diameter) or by chipping too deeply, which weakens the tree and reduces the yield of gum

When the trees average 10 inches in diameter at breast height (4½ feet above the ground) they can be turpentined profitably. Detailed information on how to do the work with the least injury to the trees can be obtained from the Forest Service, United States Department of Agriculture.

FIG 262 —This tree has been worked successfully and profitably for three years Note low face

A plan for careful and advantageous turpentining of a few well-stocked acres of long-leaf or slash pines is as follows: One scar or face is cut on each tree of suitable size. A cup, placed with the least possible cutting of the tree, is used to catch the gum The face is made narrower than the diameter of the tree. It may be chipped with about 30 to 32 successive cuts or streaks each season (from March to November) for a period of three to five years. The face will then be about 3½ to 5 feet high if the work has been done with some care On a small number of trees (less than a commercial "crop" of 10,000), the weekly chipping can probably be done along with the regular farm work and with little or no extra cost. The collected gum, dipped from the cups every three or four weeks, may be marketed by the barrel just like potatoes or other farm products.

Rest Periods After Turpentining

After the working of the first face the trees are rested for a year or two. A second face can then be cut. It should be separated from the first by at least 6 inches. The work on the second face will proceed as on the first. On the best trees it may be possible after a second rest period of a year or more to cut a third face on the wide bark strip between the first and second faces. By this time the first face will have healed over to some extent and the tree will have increased in girth.

With conservative working the gum can be harvested without much reduction in timber growth or the killing of many trees.

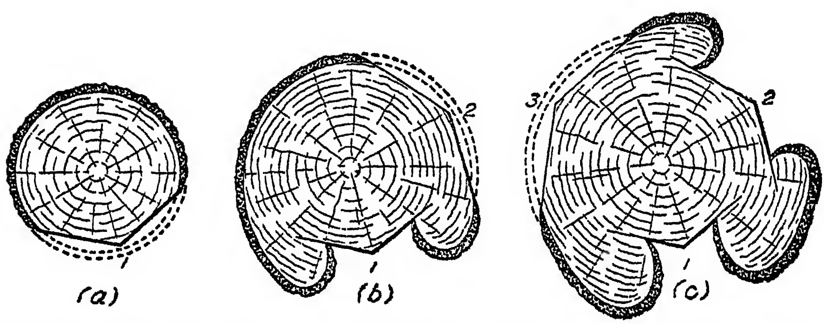

FIG 263 —Three successive workings of a slash pine tree (a) First working them 10 inches in diameter (breast high), (b) second working six years later after a three-year rest period, and (c) third working 12 years later. The tree has had sufficient live bark to keep it actively growing, although the rate of increase in size was slower while being turpentined than it was in other years

By putting in these pines on areas not suitable for other crops it is possible to raise a crop that gives a double revenue, the first part from the "gum" or oleoresin sold for the production of turpentine and rosin, and the second from the trees themselves when converted into posts, poles, lumber, timbers, fuel, and possibly pulpwood. Although the butts are scarred and distorted by turpentining and may become somewhat pitch-soaked, they may be cut into boards serviceable for many purposes, especially on a farm, or they may be removed entirely and used or sold for kindling.

ELOISE GERRY.

TREES for Windbreaks Will Grow in Nearly All Farming Districts There is scarcely an agricultural community where trees will not grow. Yet there are many farm homes which stand bleak and hard against the horizon because the owner believes that trees can not grow there. He believes this in spite of what he can see, for within the range of a day's automobile ride are farm homes where life has been completely transformed by sheltering walls of green trees. Why are the efforts of some who would have a windbreak crowned with success while so many others experience failure?

Failure usually follows an unfortunate choice of trees or the lack of proper care in planting and cultivation. Native trees are best, but often, where windbreaks are most needed, native trees are scarce. Fortunately one may profit by the experience of others and by the

results of studies made by several State and Federal experiment stations. Tree planting has been conducted long enough in all of our agricultural regions that no one need proceed in the dark.

As one goes westward across the United States the rainfall becomes less and less. This increases the difficulties of the tree planter, for soil moisture is essential. In the region east of the Mississippi River there is enough moisture in the soil so that small trees with good root systems can be planted with considerable assurance of success; but in the West the difficulties increase and require a corresponding increase in the care given to soil preparation, planting, and subsequent cultivation.

Wherever the annual rainfall averages less than 25 inches cultivate the ground and keep it fallow for a year before planting the trees. Unless the soil is moist enough to pack when held firmly in the hand the newly planted tree should be watered. Afterwards for several years the trees must be cultivated. Where there is little rainfall the competition of sod growing close to the tree trunks is likely to prove fatal.

FIG 264 —The windbreak should include several rows of trees which will grow tall and live for many years

Not All Trees Make Good Windbreak

But trees may grow and yet make an unsatisfactory windbreak. Evergreen trees, like pines and spruces, are especially desirable because their foliage protects against the cold blasts of winter. Broad-leafed trees like elm, green ash, hackberry, honey locust and cottonwood need the low branching, solid effect of the evergreens. If the two kinds are planted in the same windbreak they should be arranged so that in winter the bare high-crowned broad-leafed trees will not make holes in the wall to let in wind and snow. This can be avoided if the same kind of tree is planted in a continuous row—perhaps with evergreens on the outside and inside rows and broad-leafed trees between.

Usually the severe winter winds are from the north and west. For this reason most windbreaks have been planted along the north and west sides of the homestead.

Outside, perhaps 50 feet to the windward, may be a row or two of hardy shrubs or low-growing trees. These catch the snow and help the main windbreak to more thoroughly perform its protective function.

The ideal windbreak includes several rows of trees, both evergreen and broadleaf, which may grow tall and live for many years. (Fig. 264) Eventually they may be cut to serve as building timber, fencing or fuel, but their primary purpose is to protect the farm home and buildings.

G. H. Collingwood.

TREES of New Growth Profitable Through Call for Pulp Wood In turning its attention to the Southern States the pulp-wood industry is rapidly helping the forester and the timberland owner to solve the problem of obtaining an income from young second-growth stands of timber which would require at least 40 or 50 years of growth before becoming of commercial importance for saw timber only. The comparatively recent and rapidly increasing demand for pulp wood in the Southern States has created a market for stands of young pines which 10 years ago were considered a nuisance by many farmers and land owners.

The Southern Forest Experiment Station has under observation a dozen ¼-acre plots of loblolly and short-leaf pine which were established and thinned in 1915 and which have been thinned twice at five-year intervals since then. The results of these experiments indicate that partial cuttings made at an early age are not only financially profitable but tend to increase the growth on the remaining trees and thus reduce the time required to produce timber of saw-log size.

Results of Wood Removal

Plots on which light thinnings were made, only the small, defective, and suppressed trees being removed, showed no greater growth than did their unthinned check plots. And the light thinnings produced but a very small amount of merchantable cordwood. On the other hand, all the plots in which many of the larger, more dominant trees had also been removed showed a merchantable volume growth of 4 per cent to 29 per cent more in five years than their unthinned check plots. At the same time the greater amount of wood removed gave assurance of a financial profit on a larger operation.

The indications are that in stands of loblolly and shortleaf pine either pure or mixed and growing under average conditions, profitable thinnings can be made at an age of 20 years. At this age well-stocked stands on average sites will contain from 600 to 800 trees per acre, with 30 to 45 per cent of this number in the small, subordinate classes and overtopped by the larger, more rapidly growing trees. In a heavy thinning all of these subordinate trees should be removed and in addition those larger trees which are of poor form or which are interfering with the growth of neighboring trees. At least 50 per cent cent of the trees should be removed if any increase in rate of growth in the remaining stand is to result. In overstocked stands the thinning should be increased to 60 or 65 per cent.

Stumpage Value of Thinning

A 21-year-old stand of loblolly pine on a good site which had received no previous thinning yielded 19 cords of merchantable pulp wood per acre. (Figs. 265 and 266.) At an average stumpage

FIG. 265.—A 21-year old stand of loblolly pine growing on land formerly under cultivation. This stand has never been thinned

price of 75 cents per cord (which is by no means a top figure for the Gulf States) this represents an average value of $14.25 per acre. The thinnings from another stand of mixed loblolly and short-leaf pine growing on a site poorer than average yielded 7½ cords per acre at

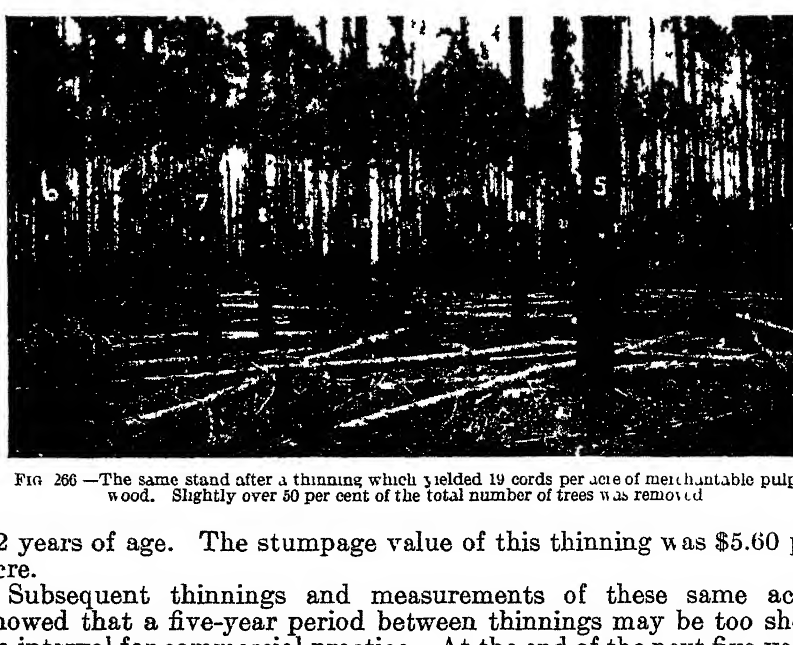

FIG. 266.—The same stand after a thinning which yielded 19 cords per acre of merchantable pulp wood. Slightly over 50 per cent of the total number of trees was removed

22 years of age. The stumpage value of this thinning was $5.60 per acre.

Subsequent thinnings and measurements of these same acres showed that a five-year period between thinnings may be too short an interval for commercial practice. At the end of the next five years

these areas were thinned a second time and yielded cordwood valued at $3.60 and $2 per acre, respectively, and at the third thinning, five years later, approximately $1.25 worth of cordwood per acre. During all this time the trees left on the heavily thinned areas were growing at a more rapid rate than those on adjacent, unthinned areas and will undoubtedly reach saw-log size 5 to 10 years sooner than the trees on the natural wildwood plots. Except where growth is exceptionally fast, heavy thinning at 10-year intervals, beginning when the stand is about 20 years of age, seems to be the best practice, from the viewpoint of both financial returns and increased rate of growth of the remaining stand.

L. I. BARRETT.

TREES Planted for Timber Often Do Best on Worn out Farm Land If there is any one kind of land which may be said generally to rank high as a favorable chance for forest planting, it is worn-out fields In the northern Lake States Norway pine, white pine, jack pine, Scotch pine, and Norway spruce grow exceptionally fast when planted on worn-out fields or cultivated land. That trees, like field crops, respond to cultivation has been shown in the planting of windbreaks in the prairie region. The surprising thing is that the pines and spruce grow as fast on the old fields cultivated years ago and then abandoned as on soils cultivated at the time of planting.

Many acres of poor sandy soils in northern Michigan were cleared years ago, farmed for a few years, and abandoned. Norway, jack, and Scotch pines on these old fields grow much more rapidly than the same species on the same kind of soils never cleared or cultivated. Norway and white pine, 10 years after planting, averaged over 7 feet high on old fields and only 2 and 3 feet high on similar wild lands. Even on rich loam soils, formerly covered with a forest of maple, hemlock, and basswood, but uncultivated, white pine plantations were only about 5 feet high as compared with 7 feet on poor sandy lands which had been cultivated and abandoned. Jack pine averaged 9 feet high at 10 years old on cultivated soils and only 6 to 7 feet on the wild lands. Apparently, therefore, trees planted on old fields grow one and a half to two times as fast as on the ordinary cut-over lands. The advantage may not continue to be as great when the trees grow older, but according to all indications a planted forest on worn-out fields will reach merchantable size for pulpwood, box boards, or small saw timber sooner than the same kind of forest planted on wild land.

An Example in Wisconsin

A good example of the excellent growth on cultivated land was found in western Wisconsin. An acre of Norway spruce, 34 years old, had over 1,000 trees ranging from 2 to 10 inches in diameter. The average height was 42 feet, and the volume in trees 6 inches and over was 43 cords. This exceptionally good growth was due in part to a naturally fertile soil but in part also to cultivation of the soil before planting.

The high yields at 40 to 50 years of white pine and red spruce in New York and New England have been found chiefly in the forests which have come up on abandoned fields. Similarly much of the

rapid-growing loblolly pine of the South has come up on fields which were abandoned about the time of the Civil War.

In the northern Lake States the abandoned fields are ordinarily on the sandy soils best suited to the planting of Norway and jack pine. On the basis of representative figures for the region, the value of the land is only $1 to $2 an acre, taxes and fire protection would amount to 15 cents an acre a year, and the planting of 1,200 1-year-old jack pine seedlings on an acre would cost $5 to $6. The plantation should yield 30 cords of pulpwood to the acre when 40 years old. At $3.25 a cord, hardly more than its present value, it would have earned 6 per cent compound interest on the costs and expenses of raising the crop. Norway pine planted 1,200 2-year old seedlings to the acre at a cost of $6 may be expected to yield 15,000 board feet in 70 years. If the value of the timber is $22 a thousand board feet when cut, the crop will have earned 5 per cent

FIG 267 —Worn-out field planted to Norway pine

on the investment. The less sandy soils are better suited to white pine and spruce, which, on such soils, make similar growth and returns. In general, planting on old fields will pay.

Other Advantages in Worn-out Fields

Worn-out fields usually have other advantages for forest planting. They are likely to be near roads and therefore accessible to a market for the products. The danger of loss from fires is comparatively small owing to the presence of roads by which men and tools can be sent there quickly, and to the absence of slash and brush which is so characteristic of the cut-over lands. Abandoned lands have low valuations and low tax rates. The early clearing and lack of brush make planting easy and cheap. Any one who owns or can acquire such lands cheaply is likely to find forest planting a profitable method of utilizing them.

JOSEPH KITTREDGE, Jr.

TUNG-OIL Tree Does Best in Southeast Coastal Regions In the United States and other countries, tung (China wood) oil is used chiefly in the manufacture of varnish, enamel paint, floor paint, flat wall paint, and paint driers. Tung oil, together with rosin ester, is used in making the well-known waterproof or spar varnish. In China and Japan, the oil is also employed for waterproofing paper and fabrics.

The oil is obtained by expression from the seeds, which are commonly called nuts, of two species of Aleurites, a small genus belonging to the spurge family (Euphorbiaceae) Both species are natives of China, the present source of commercial tung oil. The more hardy one, *Aleurites fordii*, which grows in central and western China, furnishes most of the oil produced The other species, *A. montana*, is found in southeastern China. Since the oils from these two

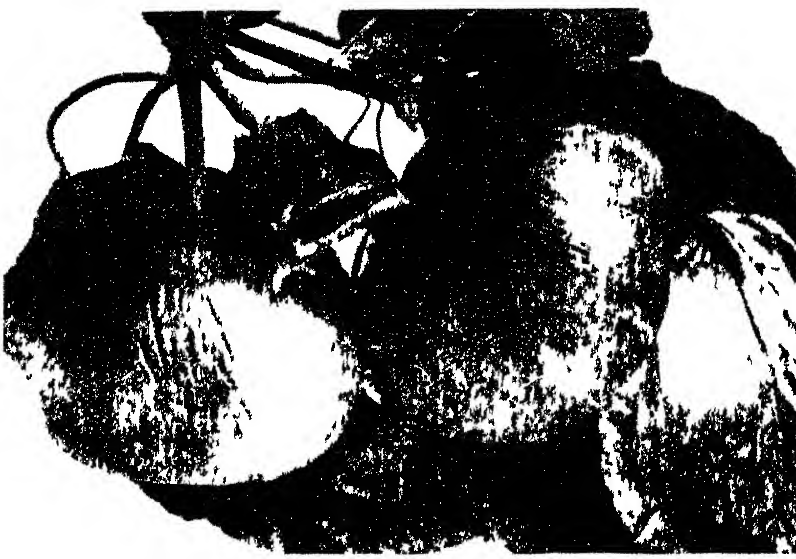

Fig. 268.—American-grown tung-oil fruits grown at Biloxi, Miss.

species are practically identical in composition and properties, the trade makes no distinction between them.

The total imports of tung oil into the United States now amount to about 100,000,000 pounds annually. The price ranges from 12 to 15 cents a pound, though it has been much higher or somewhat lower.

In the species *A. fordii* the large seeds, from three to seven in number, are contained in a tough, almost woody fruit which averages about the size of a small apple. (Fig. 268.) The fruit matures in the autumn, when it falls to the ground and is gathered at any convenient time during the next month or two. It usually splits open if left long on the ground. The seeds are removed from the hulls and crushed, and the oil is expressed. The oil obtained is equal in weight to nearly one-third the weight of the seed. Very primitive methods of expressing and handling the oil are employed by the

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Chinese. In experimental production of the oil in the United States, the same machinery as that used in expressing the oil from cottonseed, soy beans, and peanuts has proved satisfactory. The kernels of the seeds should never be eaten as they are poisonous.

The tung-oil tree reaches a height of from 25 to 30 feet, with an equal spread. The wood is brittle, and the tree itself is said to be rather short-lived—probably about 30 years. Trees often begin to bear fruit in the third year from seed. The tree also has considerable ornamental value. It bears numerous clusters of snowy white or pinkish flowers in March and April, which are followed by large, handsome, catalpa-like leaves. (Fig. 269.) The Chinese word "tung," or "t'ung," has reference to this type of leaf and is used in the names of certain other trees having leaves of similar shape. Although decid-

Fig. 269.—A well-formed tung-oil tree growing at Tallahassee, Fla.

uous, the tung-oil tree should be considered of value for park, street, and highway planting.

The growing importance of tung oil to our industries and uncertainty regarding the quantities which may be obtainable at any future time from China led to experiments to develop a domestic source of this valuable product.

First Introduced in 1905

The introduction of tung tree seed for propagation in the United States was first made in 1905 by the Department of Agriculture, with the aid of the United States consul general, L. S. Wilcox, at Hankow, China. The seed was placed at the Plant Introduction Garden of the Office of Foreign Plant Introduction, Bureau of Plant Industry, at Chico, Calif., and the resulting trees were sent out in 1906 to State experiment stations, public parks, and many private experimenters

throughout the southern and Pacific coasts regions of the country. Since about 1920, intensive study of cultural methods for the tung tree has been in progress at the Gainesville, Fla., agricultural experiment station. Much information has already been obtained in connection with the planting and growing of the trees.

The area for the most successful growth of the tung-oil tree in the United States is limited to the Gulf and south Atlantic coast regions, including the northern third or half of the Peninsula of Florida The northern limits for commercial growing probably will not be far from the gulf. Although the tree has been known to endure temperatures nearly as low as 0° F. when fully dormant, it does not thrive under such conditions, and often is injured at temperatures not lower than 18°, when these follow a warm period in winter or early spring. Specimen trees have lived for a few years and fruited as far north as Little Rock, Ark., and Clemson College, S. C., but later were killed by cold. Two or three trees are living and fruiting at New Bern, N C., but they give evidence of being just able to stand the winter climate. The tree also grows well under irrigation in certain parts of California. At the Florida State Experiment Station a type of tree much more prolific than those in China has been developed through selection and breeding

The two largest of the early tung-oil plantings in America, at the Georgia Experiment Station, Experiment, Ga., and on a farm near Robertsdale, Ala., were of 1 acre each. The former was largely destroyed by the freeze of February, 1917; the latter died from other causes. The first large permanent planting was made by the late Tennent Ronalds, of Scotland, on his live oak plantation near Tallahassee, Fla. A 4-acre planting was made in 1912, and the grove was later increased to 44 acres. About 25 acres of this grove still remain.

An Early Successful Planting

One of the earliest successful small plantings was at the Florida Experiment Station, at Gainesville, and as a result of the observed behavior of these few trees, there has been planted near that city since 1923 a total of about 1,600 acres. Many of the trees are already bearing small crops of fruit. The active cooperation of specialists of the University of Florida with the growers in the study of the various problems encountered in the efforts to establish the new industry on a sound basis has given it additional stability.

The earlier and smaller plantings have produced fruit for some years, but up to the present season it has been necessary to use practically all the seed for planting in order to meet the demand for young trees. From 1923 commercial scale plantings have been in progress, especially in the vicinity of Gainesville, and at present Florida has between 2,000 and 3,000 acres planted to tung trees. Experimental plantings are being made where conditions appear favorable in some of the other Southern States.

Although tung trees grow well on a variety of soils, it has been found that a well-drained, deep, light, slightly acid soil supplied with organic matter is best. These trees will not thrive in an alkaline soil. They are planted at various distances apart when set in orchard, but a mature tree will occupy a space from 20 to 30 feet in diameter. The trees are sometimes set 12 by 25 feet, with the intention of removing the alternate trees when they begin to crowd. The trees

are planted much like common orchard trees and require similar fertilizing and cultivation, at least during the first few years. The precise nature of the care needed depends largely on the character of the soil.

At various times in recent years, small quantities (from 30 to 600 pounds) of domestic tung "nuts" from Florida and several other States have been pressed at the department's oil, fat, and wax laboratory and elsewhere. Light-colored oils, low in free fatty acids, were obtained. They were found by tests to be superior to most, if not all, of the product imported from China, the larger part of which is still produced by the same crude, primitive methods in use many centuries ago. Pale or light-colored American tung oil of fine quality will be of use in the manufacture of white and tinted paints, and pale clear varnish.

R. A. Young and
George S. Jamieson.

TURF GRASS of Finer Kinds is Subject to Brown-Patch Disease During the summer months, turf of the finer grasses, especially bents and fescues, frequently becomes brown in patches, even though adequate moisture and plant food are available. Although common on lawns and other places where fine turf is used, these unsightly patches of browned or dead turf are most objectionable on golf greens. Such browned areas are usually evidence of diseases caused by fungi which have penetrated the grass blades and killed them.

The two most commonly recognized turf diseases are large and small brown patch. In the case of the former the diseased area is frequently 2 or more feet in diameter, whereas small brown patch usually becomes no larger than a silver dollar, which has led to its other common name, "dollar spot." The blades affected with small brown patch have a lighter, more bleached appearance than those killed by the other fungus. Diseased patches may be so numerous that large areas of turf are practically destroyed, necessitating replanting.

Both of these diseases are largely influenced by environmental conditions. Heavy dew on grass throughout the night, lasting late into the morning, is favorable to the growth of the fungi causing these injuries. Large brown patch requires a relatively high temperature, its optimum being somewhat above 85° F. Therefore the greatest losses usually occur during July and August. Small brown patch can develop at a much lower temperature and is often injurious in late spring or early fall as well as during the summer months.

Nitrogen Aids Against Disease

Much of the damage from these diseases can be prevented by care in the application of water and fertilizers. Plenty of available plant food, especially nitrogen, is important in aiding grass to recover from attacks of disease, but excessive fertilization tends to make turf "soft" and more susceptible to attacks of the large brown patch. Likewise, a liberal use of water keeps turf growing rapidly, but excessive quantities make it more liable to be injured by these diseases.

Since moisture on the blades of grass makes conditions favorable for the disease-producing fungi, evening watering, poor air circulation, shade, or other means of favoring prolonged covering with dew, all tend to increase the likelihood of injury by brown patch. In many cases it is possible to provide better air circulation, to water the turf early in the morning during periods of hot humid weather, and otherwise so to modify conditions that brown-patch injury will be greatly reduced.

Bordeaux mixture sprayed or dusted on turf has been used for several years to check attacks of large brown patch. More recent observations have shown that the copper in Bordeaux mixture accumulates in soil and ultimately is apt to cause much more serious damage than is caused by brown patch. For that reason the use of Bordeaux mixture on turf is now being discouraged. The most effective chemicals at present used for controlling turf diseases are those containing mercury. Experiments have demonstrated that most mercury compounds are effective and that their value depends chiefly on the mercury content. Among those most commonly used for this purpose are chlorophenol mercury (semesan and uspulun), corrosive sublimate, and calomel. Any of these chemicals when used in excess will injure turf, but there apparently is no danger of an accumulation in the soil such as has been found to be the case with copper compounds.

JOHN MONTLITH, Jr.

TURKEYS Thrive Well With Limited Range If Soil is Sanitary

Ever since the Pilgrim Fathers originated the custom of having roast turkey for Thanksgiving dinner, there has been a keen demand for this fowl. The demand is based not only on the Thanksgiving customs, but on the excellent flavor of the meat.

As wild turkeys decreased in numbers, farmers took up the raising of domestic ones, adopting methods similar to those used for the poultry flock. The eggs were hatched by natural incubation methods, and the turkeys raised in broods which ranged the fields. At one time turkey raising was an important part of farming operations of the Atlantic Coast States. A disease known as blackhead made its appearance, and up to the present time no reliable cure for it has been discovered. It was found that a small, cecum worm played a large part in transmitting blackhead. The egg of this worm develops on the ground to the infective stage and is taken into the intestinal tract with the feed. Eggs from the worms infecting turkeys suffering from blackhead will produce blackhead in susceptible turkeys. It was owing to this disease that turkey raising was gradually abandoned on the eastern farms and taken up in the wide, open-range country of the West and Southwest, where the ground contained less infection.

With the shifting of the production area there came a great decrease in the total number of turkeys. The decline was very rapid from 1890 to 1910, according to census figures, while from 1910 to 1920 the decrease in numbers was not so marked. Formerly the turkey was considered a wild fowl that would not thrive in confinement, but recent developments have disproved this theory. If strict rules of sanitation are observed, the turkey can be raised with limited range. (Fig. 270.)

Contaminated Soil Caused Losses

It was not the keeping of the birds in fenced inclosures but contact with contaminated soil that killed them

At the Nebraska experiment station three pens of turkeys were raised under artificial conditions. Small yards, colony houses, brooder stoves, and wooden feeding troughs were used. One yard was covered with 8 inches of washed gravel, and 69 out of 70 poults were raised to maturity. In the other yards special soil-sanitation practices were not adopted and a much higher mortality was experienced. On the gravel yard the filth-borne diseases were eliminated.

Pathologists have observed that poults are most susceptible to the disease during the first 10 weeks, and that if the intestinal tract is kept free from parasites during that period and the poults are then

FIG 270—Close confinement of turkeys has proved to be practicable Note brooder house and roosting poles

grown on clean ground, there is a reasonable assurance of raising most of the brood. This practice is followed on a Massachusetts farm which sells more than 1,000 turkeys each year. Colony brooder houses are thoroughly cleaned and moved to a field where neither chickens nor turkeys ranged the previous year. A generous supply of coarse, clean sand is placed on the south side of each house. The poults are confined to this sand yard until they are past the danger stage. They are hatched in an incubator, brooded under a colony brooder stove, and fed and handled much like young chickens.

The improvement of mechanical means for hatching and brooding has done much to develop this phase of the turkey industry. Day-old poults are now shipped by parcel post much the same as baby chicks. In brooding, care must be taken to supply plenty of heat and not overcrowd the house. One hundred poults are sufficient for a 10 by 12 foot brooder house.

Colony Brooder Houses

For several years the Minnesota Experiment Station has been successful in raising turkeys in colony brooder houses. The station's plan of soil sanitation is one of rotation rather than the use of a sand or gravel yard. A temporary fence is used to inclose a small area near one corner of the brooder house. At the end of from five to seven days the fence is moved so that the range at another corner is utilized. When all four areas have been used the brooder house is moved to fresh, uncontaminated soil. The frequent moving of the range and keeping the poults off the ground, once it has been used, breaks up the life cycle of the worm egg and helps to keep the intestinal tract free from parasites.

One very often hears the expression, "We do not have any luck with turkeys," but in the light of recent findings the words "proper sanitation" should be substituted for "luck." By starting the poults in clean quarters and ranging them on soil on which neither chickens nor turkeys have been reared the previous year, the average grower can be reasonably sure of success if he follows proper artificial incubation and brooding practices.

H. L. SHRADER.

TURPENTINE Distilling by New Steam Still Has Many Advantages Although in France steam plants have been used extensively for the separation of crude turpentine gum into spirits of turpentine and rosin, in the United States a large copper kettle and condensing worm are still used. The kettle is heated by a wood fire, and removal of the volatile constituents is facilitated by the admission of a small stream of water into the still during distillation. The flow of water must be such that a steady boiling of the turpentine from the gum with a gradual rise in temperature is maintained without flooding the still, in order to secure the lightest colored, that is, the highest grade of rosin which the gum will yield. Thermometers of both the mercurial and recording types are used to keep the distillation under control, but even with this and other modern improvements for controlling the process it is easy to make a mistake and scorch or degrade the rosin. Because distillation by steam is considered more nearly "fool-proof" and produces a uniform high-grade rosin under almost any condition of operation, the Bureau of Chemistry and Soils made a study of steam stills.

Several steam stills have been made in the United States during the last few years, but all of them are of the types used in France, which require the removal of the coarser foreign matter, such as chips, bark, and needles, from the gum before distillation. Steam stills have not operated with entire satisfaction on American gum, because the gum obtained in the United States contains more foreign matter and is more difficult to handle than that obtained in France. As these steam plants are expensive and permanent, their general use in the United States is restricted. They are better adapted to the larger centralized plants than to the smaller operations in the woods, where the site of the plant is usually changed every few years.

The Bureau of Chemistry and Soils sought to perfect a steam still which would be well adapted to American methods of operation, and

in which the crude gum could be handled without preheating and cleaning as simply as in the old fire still. It is, however, recognized that precleaning of the gum is necessary to get the highest grade of rosin obtainable.

Satisfactory Steam Still Designed

In the spring of 1927 the United States Department of Agriculture with the cooperation of a turpentine operator designed and installed a steam still that would utilize to the greatest extent the present fire-still equipment. It operated satisfactorily. This steam still is so designed that a fire still can be converted readily into a steam still by changing the bottom and placing steam coils and a steam jet of special design in the interior. This still discharges in the same manner as the fire still. It has the same tail pipe and gate. Consequently the same method of straining rosin with wire screens and cotton batting is used. It is charged like the fire still, and the coils are so arranged that the charge can readily be skimmed when desired.

FIG. 271.—Plant in Mississippi using for turpentine distillation a steam still designed by the United States Department of Agriculture

The same "cap" is employed for the discharge of the vapors. The condenser worm can also be used, but as the steam still operates more rapidly than the fire still a larger condenser is desirable. A boiler to provide the necessary steam is the only additional equipment required. This still is entirely suitable for handling cleaned gum

Distillation by steam has many advantages over distillation by fire. It is less subject to damage from neglect and mistakes. It is difficult to degrade the rosin by faulty methods of stilling. The operator is sure to make the highest grade of rosin that the crude gum will produce. In a series of special tests the steam still produced rosin that averaged about one grade better than that made with a fire still. The distillation is practically automatic. Perfect temperature-time charts are formed with but little attention on the part of the distiller. Less labor and, for rapid distillation, less fuel are required. As it is possible to burn almost any kind of fuel under the boiler, cheaper grades of wood can be used than with the fire still. The fire hazard is greatly reduced, and since the boiler is

separate from the still shed the equipment can be kept cleaner than at the fire still. The boiler of the steam still can be used also to run a pump, saw, and other machinery without material additional expense for fuel. In a plant where several fire stills are operated the steam still offers a further advantage in the centralized means of firing provided by the boiler.

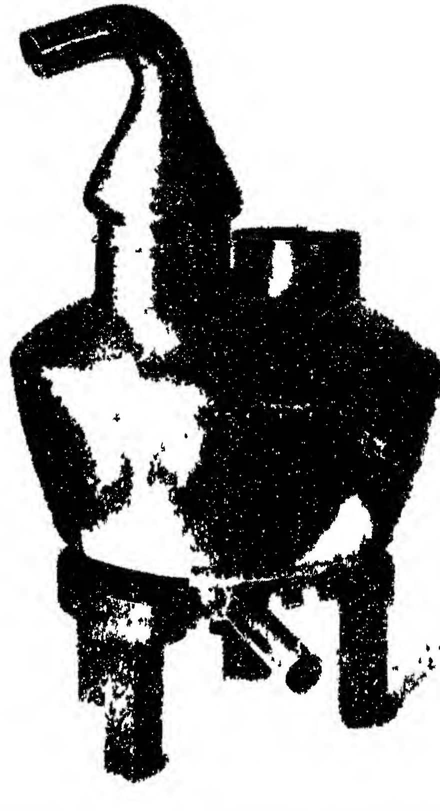

FIG. 272.—Model of the steam turpentine still designed by the United States Department of Agriculture

Wider Use of New Method Probable

It is believed that this type of steam still has sufficient advantages to warrant installation by operators working 20 crops or more. Although this steam still has been in use but one season, a number of operators throughout the naval stores belt are planning to adopt steam plants as a result of its satisfactory operation.

Specifications and blue prints of the design of the steam still have been prepared and placed in the hands of the turpentine-still builders. They can be obtained also from the Bureau of Chemistry and Soils, United States Department of Agriculture.

J. O. REED.

VACATION Camps Give Rest and Instruction to Many Farm Women Farm women to-day do not want to be patronized, but sometimes they long for encouragement and sympathetic understanding in their great variety of duties and tasks. In such moments it is to the county home-demonstration agents they often turn for counsel and guidance in making seemingly impossible desires and dreams come true. Such confidential remarks as that they had not been away overnight from the farm or ranch in seven or eight years, and that the monotony of hard work preyed upon their minds, set resourceful extension agents to thinking as to how a vacation could be made possible for them. Inquiry proved that a large number of women needed and wanted a change, even though it were only for a few days.

The happy idea of out-of-door camps where farm women could rest, play, and learn first materialized in the States of Montana, Tennessee, West Virginia, and Texas in 1921 and 1922. The idea has spread because it is fundamentally sound and just, as evidenced by 19,957 women attending 203 camps in 1927 in 30 States in all sections of the country. The out-of-door vacation camps for farm women have been fostered by the agricultural and home economics extension service in the following States: Alabama, Arkansas, California, Delaware, Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Minnesota, Missouri, Montana, Nebraska, New Mexico, North Carolina, Ohio, Oklahoma, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Vermont, Virginia, Washington, West Virginia, and Wyoming.

The restful, care-free, and inspiring camp vacation is happily recalled in appreciative expressions by the women who have had such vacations. "No family, no chickens, no debts for three whole days. It was the first time I had been away from home to spend the night in 10 years. What joy!" was the exclamation of a southern farm woman. "The recreational camps are especially needed in this county of great distances, since the people are strangers to each other. They find the camp a way of knowing their neighbors and of finding themselves in this new country" is an expression from the far-western rancher. The busy farm woman of the Middle West, too, is enthusiastic with the remark, "The mothers' camp is a change from the everyday routine. When we returned home we got at our work with more pep and cheerfulness. We delegates passed on what we learned so that it might benefit a large number of homes in the community." A farm woman in the East wrote the president of the community club, "You'll just have to call a meeting the minute I get back, for it's all too good to keep."

Beautiful Surroundings, Fresh Air, and Good Food

Usually a camp committee of farm women assists the county extension agents in the publicity, in procuring enrollment, and in the general plans and management. The camps are open to all farm women in the county or to an allotted representation from several counties. The latter are known as district camps as exemplified by seven 1927 camps in Montana, with representation from 152 communities in 30 counties, and 7 camps in Nebraska, representing 28 counties. Georgia, California, and West Virginia are the only States which have established permanent camping sites where annually farm women's camps are held with more or less state-wide representation.

In selecting a camp site a beauty spot away from outside disturbances where the loveliness of the scenery itself is conducive to relaxation is chosen. An established site on the wooded mountain or on the river or lake facilitates hiking, or boating, fishing, and swimming as part of the recreational program. Occasionally the hospitality of a private lodge or clubhouse as a camp center has been accepted. The camps have averaged three to four days in length. Usually the campers arrive in time for supper the first day. The program continues throughout the second and third days, and the camp breaks after breakfast or lunch on the fourth day

Good food and plenty of it, balanced menus planned by the extension nutrition specialist, meals well prepared by a special cook and served cafeteria fashion, have proved important factors in the success of the camps. Always the women say how delightful it is to sit down to meals prepared by some one else and how pleased they are to carry home the mimeographed recipes of the new dishes which have been served.

Cost of the Vacations

What does this vacation cost? The camp fee covering the actual cost of food, its preparation, and rental on cabins and tents, if any, varies from $3 to $9 per person, depending upon the number of days. In Kentucky it was found possible to reduce the cash fee for a four-day camp to $1.50 per person by requesting that the entire food supply be brought to the camp by the women. Those who enrolled were notified of the proportional amount required. Another plan followed by Michigan, Nebraska, Wyoming, and Texas—a certain fee plus a specified small amount of farm produce—has been found successful. Another type of camp is popular in Idaho, where groups of women bring camp equipment and provisions and prepare their meals. They either furnish their own camp tent or rent a cabin.

A vacation without much advance preparation makes an appeal. With the comfortable knicker suit or trim house dress, an old coat, easy shoes, a few toilet articles, several tin articles for mess use, a bed roll with warm blankets, and with joyous expectation the camper drives off with other women of the neighborhood.

At the Camp

Upon arrival at the camp the women are greeted by the extension agents and the camp committee, who assist them in registering and locating camp quarters and make them feel at home by the warm welcome. The first evening is "who's who night," when each one is placarded with her respective name, community, and county. Sometimes there is tribal organization and each tribe gives itself a queer Indian name and elects a chieftain, or groups with captains are presented colors, who christen themselves Sunkist's, Brown Betty's, Yellow Jackets, or other colorful names. Jokes, stories, and songs create informality and good cheer and The More We Get Together, The Happier Are We, is sung as enthusiastically as by a bevy of college students. An early-to-bed is announced, and the close of the day is made impressive by singing taps under the star-lit sky.

The rising bell, flag-raising ceremonies, setting-up exercises (called by some up-setting exercises), and breakfast begin the day. The program for the day is a combination of rest, recreation, and profitable learning. There are rest periods for napping and quietude. There are do-as-you-please periods when one can indulge in her favorite sport, be it strolling, fishing, boating, or chatting with old and new friends. Supervised early-morning bird hikes are popular in some camps, and in the mountains a hike with a guide, who can identify the trees, the shrubbery, and the wild flowers is the camper's delight.

The women come expecting to take home new ideas which they can put into practice back home, so that they do not find it difficult to give close attention under camp conditions to the instructional program. (Fig. 273.) The State extension leaders and specialists

usually contribute to this program, as well as other selected talent. A review of the camp programs of the several States shows that through interesting talks and attractive demonstrations the women have learned new ways of preparing and serving food and new short cuts in the construction of the family clothing. They are impressed with the illustrated demonstration on how to select suitable and becoming clothing with some of the camp women being used as models. Positive health teaching and the relation of food, clothing, and living habits to health take their place on the program. Practical hints in home management and house furnishing making for convenience, comfort, and attractiveness of the home always are of appealing interest

FIG 273.—Helpful information applicable to farm and home life is presented at the farm women's camps

Beauty the Keynote of Some Programs

Beauty is the keynote of some programs. It is charming as well as practical to learn how to do over old furniture with paint and enamel of soft tones, how to use the dye pot to add color to old furnishings and draperies, and how to select and hang pictures properly. How to grow flowers and to arrange them in decorating the home is often another appreciated feature in such beauty programs. No less important is the instruction given in the improvement of personal appearance. An appreciation of good music is encouraged through musical memory tests and by the favors of the best musical talent in the community.

Sometimes an afternoon session is spent in visiting and in learning some small craft like basket weaving or tooling leather. Decorative and useful articles are made by using paint on fabrics or oil cloth. Gracefully shaped bottles or jars with a little enamel paint are converted into vases for flowers, or perhaps a well-chosen colored maga-

zine print is mounted. These small craft pieces are shown at home with some pride.

The play hour usually held in the cool of the evening is enjoyed by all who wish to indulge in the games under the supervision of the recreational leader. (Fig. 274.) Jolly games like potato "pass 'em back," peanut race, push balloon, and shoe scramble are played in contest between the several tribes or groups, and sometimes folk dances are taught so that the women can teach them to boys and girls in their neighborhoods. Clever songs and yells composed by the women have a place in the spirited contests and cause much merriment.

At least one camp fire with story and song is a feature without which no camp is quite complete. The huge pop-corn popper or the big box of marshmallows sometimes comes out as a camp surprise.

FIG. 274.—Exercise and play are part of the recreational program

The last night is usually stunt night (sometimes called "hy jinks" night), and submerged talent has an opportunity for expression. It being visitors' evening for husbands and friends, it is a real event.

During the camp the president of the agricultural college, the director of the extension service, or some other friend of farm life favors the camp with inspirational talks. The entire camp program is one of inspiration to the farm woman, who returns home happy and rested, having renewed old acquaintanceships, formed new friendships, gained helpful information, and absorbed a bigger and finer outlook on life. She has had a real vacation by getting away from the usual, doing new things, thinking new thoughts, absorbing new ideas without an overamount of conscious instruction. Good-bys are said with the resolution to attend the camp next year and to encourage some neighboring friend to come.

MADGE J. REESE.

VEGETABLE Diseases in Transit and Markets Take Enormous Toll It is only within comparatively recent years that the farmers, produce dealers, and transportation companies as well as the consumer have begun to appreciate the tremendous importance that plant diseases bear to marketing perishable produce. As a whole, crop production is on a fairly satisfactory basis, but the same can not be said of crop distribution and marketing. This is largely due to loss of produce through decay caused by plant diseases. Growing a crop is only half the battle. Very often fully half of a given crop of vegetable produce is lost during transit and marketing. This loss is extremely serious, not only on account of the loss of the product, but because of the labor and expense involved in grading, packing, and transporting.

FIG 275 —Culls in a carload of potatoes showing Fusarium tuber rot

The vegetable diseases that are a common cause of damage in the field during the growing season are often important in causing loss during transit and marketing. Investigations show that production problems are frequently the beginning of transit and marketing problems of equal or even greater importance. In addition to these, however, there are many diseases practically unknown in the field which are extremely important in causing decay during transit, storage, and marketing. Very often it is these diseases that determine whether or not a crop yields a profitable return. Improper harvesting, packing, and handling methods which cause excessive bruising and wounding of stock make possible the development of many destructive diseases after harvesting.

For example, Fusarium tuber rot (fig. 275) of the late potato crop frequently causes greater loss in storage and transit than any other

decay. This decay in practically all instances is due to wound infection of stock injured during the harvesting process and is of little consequence as a field disease. Likewise, in the southern potato crop, the damage caused by slimy soft rot, following the injury produced by sun scald at digging time, is in many seasons more serious than that caused by any other disease. Stem-end rot of watermelons, which has caused thousands of dollars' loss during transit and marketing, is almost unknown in the field, because the infection which produces this decay takes place at the stem end after the melons are clipped. Until the transit and market phases of this disease were worked out, it was impossible for the growers to understand how a carload of good melons could show 25 per cent or more of decay on arrival at the market after a short transit period.

Gray Mold of Onions

Gray mold or neck rot, one of the most important storage rots of onions, is another excellent example of a disease that follows immediately after the product is harvested. It is usually of minor importance in the field, but in storage and transit it frequently causes more loss than all the other diseases combined. A study of the temperature relations of the causal organism has shown that this fungus is able to grow and cause decay at cold-storage temperature. Control of this disease is therefore not obtained by refrigeration, but by rapidly and thoroughly curing the onions at harvesting time in order to prevent infection.

Rhizopus rot of sweet potatoes, unknown as a field disease, is one of the most serious diseases of sweet potatoes while in storage, transit, and on the market. The fungus gets into the roots through wounds, and under favorable conditions a rapidly developing decay results. It is not uncommon to have from 10 to 40 per cent of a lot of sweet potatoes lost through decay by Rhizopus rot before reaching the consumer.

A knowledge of the transit and market phases of diseases affecting such perishable crops as the tomato is imperative in order to avoid excessive loss. Most of the field diseases are important in causing decay in transit, and in addition there are numerous secondary rots that develop in wounded and bruised stock. Investigations of the tomato diseases that affect Florida stock have shown that it is not advisable to ship tomatoes immediately following a rain when such diseases as buckeye rot and soil rot are present in the fields. In wet seasons it is necessary to exercise great care in sorting the fruit previous to packing, in order that all visibly affected tomatoes may be discarded. Not only the diseased fruits included in a pack decay, but the neighboring fruits become infected and decay by the time they reach the retail trade. Even under close inspection and grading, a loss of 10 per cent or more may be expected during seasons favorable for the development of certain diseases. Test shipments of southern tomatoes sent to the northern markets show that apparently healthy stock may under suitable conditions show on arrival an appreciable percentage of decay caused by one or more of the following diseases: Soil rot, buckeye rot, nailhead rust, Phoma rot, Rhizopus rot, Fusarium rot, Alternaria rot, and bacterial rot. In a like manner, equally important diseases of other vegetables might be cited which seriously interfere with the distribution of our most valuable crops.

Study of Plant Diseases

The study of the plant diseases which cause loss of vegetable and fruit produce under transit, storage, and marketing conditions is one of the unique and important services maintained by the Bureau of Plant Industry of the United States Department of Agriculture. The office maintained in connection with the food-products inspection service of the Bureau of Agricultural Economics and with the research laboratory conducted in cooperation with the botany department of the University of Chicago constitutes the only project of the kind in the United States. The service in the identification of diseases is one of the important contributing factors in making the Government certificate covering quality and condition of perishable produce so highly prized by the trade. This inspection service is the only one giving impartial and reliable information regarding the specific cause or causes of deterioration of food products in transit, storage, and on the market. The naming of the specific disease causing the decay is of value to all parties concerned. The growers and shippers are informed of the diseases shown by their produce on arrival at the market, and their attention is called to the need for preventive measures to combat these diseases. Furthermore, the information regarding plant diseases is necessary for the proper adjustment of claims, since it helps to place the responsibility for loss.

G. B. RAMSEY.

VEGETABLE Gardens of U. S. Owe Much to American Indian

Probably few people give much thought to the debt we owe to the unnamed human beings who singled out the ancestors of our present food plants from among other less desirable wildlings. The process by far antedates written history. The faint glimpses obtained of the earliest civilizations in Mesopotamia and Egypt show a relatively advanced agricultural practice. There are few regions in the world at present so isolated that they do not share in the portion of this debt due to the American aborigines.

The American vegetables which are now used in the gardens of the United States are listed and grouped in Table 17. Two bases of classification have been used—the source of the species and the part of the plant used for food.

TABLE 17.—*Native American garden plants grown in the United States*

Origin	Plants grouped according to part used for food		
	Root or tuber	Fruit	Seed
Native to United States	Jerusalem artichoke		Tepary bean.
Exotic			
Introduced into United States by Indians.		Bean. Common Scarlet Runner. Squash: Cucurbita maxima C. pepo. C. moschata.	Bean: Common Scarlet Runner. Lima. Sweet corn.
Introduced into United States by white people.	Potato Sweet potato.	Tomato Pepper. Physalis. Chayote.	Peanut.

Of the 16 species of plants listed, only two unimportant ones are native to the United States. All the others, whether used by the native Indian tribes or later introduced, are exotic. This scarcity of garden plants native to the United States is probably due to more than one reason. The native flora of this country may have been poor in promising garden material. The list of native fruits and nuts is a much more impressive one. The plum and grape industries owe much to native plants. The Indian tribes of the United States used many plants from the forests, marshes, and prairies which they had not yet domesticated. Their white successors brought with them a long list of European and Asiatic vegetables with which they were content. They were past the stage where they were developing unpromising wild plants into desirable garden vegetables. It seems probable that the almost complete lack of native plants in our gardens may be partly due to paucity of native material for the purpose but is in large measure due to the lack of inclination to explore and experiment on the part of a population sufficiently well fed with plants already domesticated.

Native Plants Acquiring Garden Status

There are some native plants which are acquiring garden status. Probably the most interesting of these is the pokeberry (*Phytolacca americana*). This is cut from the wild and sold in the markets each spring and summer by the ton, and occasionally it is cultivated. There is little if any evidence, however, that the Indians used this plant for food.

It is noticeable, also, that the list includes no salad or potherb plants, all the vegetables falling into three groups—root or tuber, fruit, and seed foods. It is apparent either that the Indians did not use salad and potherb plants or that their successors were better satisfied with their accustomed Old World plants.

The Indian tribes within the present boundary of the United States who had attained the highest agricultural status were those of the semiarid Southwest, who lived in communal dwellings and practiced careful methods of water utilization and conservation. Their varieties of vegetables, however, have had little influence on the gardening of the United States east of the Rocky Mountains, partly because these varieties are not well suited to the more humid East. Among the tribes with whom the whites came into earliest contact on the eastern seaboard, the Iroquois of western New York were farthest advanced agriculturally. Our knowledge of Indian varieties of garden plants is largely gained from them. Indian agriculture in the eastern United States was based on three plants—corn, common beans, and squashes. These were planted in the same field, a practice which is yet quite common among their white successors.

The Jerusalem Artichoke

The Jerusalem artichoke can hardly be said to be domesticated, since all our varieties are pick-ups from the wild. It has increased in interest because it is suitable food for diabetic patients and because there is promise that it may become a source for levulose.

Four American species of beans are grown in this country.

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1. The Tepary bean (*Phaseolus acutifolius latifolius*) is native to the southwestern United States. It is extremely drought resistant and will make a crop on less rainfall than any other bean. During the World War its plantings were largely extended, but it did not take well in the markets, so at present it is grown very little. It does very poorly in the humid part of the country.

2. The common bean (*Phaseolus vulgaris*) is by far the most important species of the genus. The Indians grew this bean wherever they practiced agriculture. It is not a native of the United States. Some of our present-day varieties seem to trace to the Indians. Kentucky Cutshorts and Nancy Hanks, both grown as "cornfield" beans, are Indian sorts. Several varieties now called "cranberry" beans were so called by the Iroquois, and it seems likely that many of the numerous unnamed types to be found all over the country trace to the Indians. The account often given in connection with the origin of bean varieties, that the type in question was first found in the crop of a wild goose, is also an Iroquois story.

Varieties of Beans

The bean varieties usually grouped under the name frijoles are from the aboriginal agriculture of the Southwest and include Pink, Mexican Red, Pinto, Bayo, Great Northern, and a host of others not widely known. This group does not grow well in the humid East.

The small white beans which form the bulk of our dry beans are matched by types from western South America, as are our garden varieties which pass under the general name of horticultural beans.

3. The Lima bean (*Phaseolus lunatus*) was known to the Indians of the Southeast and probably to those of the Gulf coast but these varieties have not spread widely. The species is said to be found wild in Brazil. Most of our present-day types trace to western South America.

4. The Scarlet Runner bean (*Phaseolus coccineus*) was grown to some extent by the southwestern Indians. It is at present about as largely grown for ornament as for food. It is used most extensively where the Lima does not succeed, as in the Pacific Northwest.

Squash

The term "squash" as here used covers the forms usually called squash and pumpkins. Three species are involved, and all were known and cultivated by the Indians before the discovery of America. *Cucurbita maxima* includes most forms called winter squash, such as Hubbard, Boston Marrow, Banana, and Pikes Peak, together with some of the large-fruited forms which take prizes at county fairs as the largest pumpkin. *C. pepo* is the most varied species and includes summer squashes and vegetable marrows, with Connecticut field pumpkin and New England pie pumpkin and a host of small-fruited winter-squash forms of which Des Moines is a good example. *C. moschata* includes the crook-necked winter squashes, Tennessee sweet-potato pumpkin, and Kentucky cheese pumpkin.

Most of the cultivated varieties of squash are derived from Indian forms, though some probably come from western South America.

We owe our first sweet-corn varieties to the Indians, but the present long list of types is largely from selection work by white growers. Sweet corn has been known only since 1779, when it was obtained from the Susquehanna Indians.

Solanaceous Plants

The Indians used the native wild forms of ground cherry (Physalis sp.). The species most largely grown at present is South American.

The tomato has come to our gardens from Mexico by way of Europe The oldest illustrations in European herbals show a much-ribbed fruit about as large as the largest present-day varieties. Present varieties are largely the result of selection by the whites.

The pepper plant was known to the southwestern Indian tribes. It is widely used over the world as a condiment. Our present sweet varieties came from Europe.

Potatoes were unknown to the Indians of the United States. The potato is the most valuable of all our vegetables at present.

The vine fruit known as chayote is beginning to be grown in the warmest parts of the Gulf region.

The peanut, a South American plant, was introduced by the Caucasians.

The sweet potato probably was first brought to this country by the white race. It is South American in origin and is widely used in all subtropical parts of the world.

To the Indian natives of the territory which now forms the United States our gardens owe sweet corn and many of the varieties of common beans and squashes. The Indians knew Lima, scarlet runner, and Tepary beans. To the Indians south of the United States our gardens owe potatoes, tomatoes, sweet potatoes, peppers, physalis, peanuts, and chayote.

It is plain that those who have inherited the Indian's soil and climate owe more to him in garden vegetables than to all the world besides. Americans rarely sit down to a meal where these Indian plants are not represented, and often they form the predominant portion.

D. N. SHOEMAKER.

VEGETABLE Industry has Big Expansion in Quarter Century The production of vegetables in the United States has been greatly increased during the last quarter of a century. To accomplish this increase and to provide fresh vegetables throughout the 12 months of the year, every favorable natural condition for the production of such crops has been taken advantage of. Not only this, but modern transportation, utilization, storage, and marketing facilities have played important parts in making possible this great agricultural achievement.

From comparatively limited areas in the tidewater section of Virginia and in northern Florida the vegetable industry has expanded since 1890 to proportions which are measured in hundreds of thousands of carloads annually. During the period from 1920 to 1925 the average annual shipment of vegetables was 230,263 cars. This great food supply was contributed to by all of the 48 States, and the crops

were so distributed that fresh vegetables of several important classes were constantly before the consuming public. This production is chiefly from field-grown sources, supplemented, in some of the special features, by products from greenhouse establishments. The aggregate value of vegetable products of the United States is in the neighborhood of $750,000,000 annually.

The wide extent of territory covered by the continental United States provides a diversity of climatic conditions which makes it possible to take advantage of localities possessing peculiar conditions suited to the production of special crops at particular seasons of the year. These producing areas are so completely connected with the great consuming centers by modern transportation facilities that it becomes possible to take advantage of these provisions of nature to supply our great city populations with the fresh vegetables which in recent years have become such an important feature in the daily menu of the city dwellers. Few people stop to think that in May the muskmelon which is served for breakfast could come from the Imperial Valley of California; in June, from the Imperial Valley or from Arizona; in July, from Arizona, Arkansas, central California, Indiana, New Jersey, North Carolina, South Carolina, or Texas; in August, from a still greater number of sources; but in September, chiefly from Colorado and Maryland, with the October supply restricted to Colorado.

Lettuce Marketed Each Month

The lettuce which is used in the salad served at luncheon may come in January from greenhouses in Ohio, or from the fields of Florida, the Imperial Valley of California, or from Arizona. In fact this commodity is available in carload lots from various sources in the United States each month throughout the year. During 1926 the smallest monthly movement of lettuce was 2,705 cars, and this took place in July. The largest monthly movement was in December, when 4,300 cars were in transit. The next largest shipment was in January, when 4,253 cars moved. A total of 41,960 cars of lettuce reached the markets of the United States from its own territory during the 12 months, and in addition to this Mexico contributed 29 cars and Cuba 1. Yet this industry was not recorded as existing when the census of 1900 was taken.

The same factors which make it possible to grow lettuce in the open in various localities 12 months in the year also make it possible to grow two crops of onions—one in the northern portion of the United States, in New England, New York, Ohio, Michigan, and Colorado, and the other in southern California and in Texas, one crop being harvested in September and October, the other in April and May. These same factors also make it possible to harvest a large annual supply of long-keeping cabbage in the New England States, New York, Wisconsin, and Colorado in the late fall and to market another crop directly from the fields of Florida, the Carolinas, and Virginia from January to June.

Celery, which is very exacting in regard to its soil and temperature requirements, finds a congenial field for growth in several of the Northern States from April until October and in Florida and California from December to May.

The tomato crop offered in the markets of the United States is produced from December to June in Florida and from November to

January in Texas, and again from May until August in Texas and from June until October in some 28 other States, Florida, California, and Texas opening the year with January shipments and California and Texas closing it in December.

Tomatoes in January

In 1927 there were 80 carloads of tomatoes shipped from fields in the United States in January and 362 in December, the smallest movements taking place in January, February, and December and the largest in June, when 6,466 cars were placed on the market. Besides the 32,643 cars of tomatoes shipped from within the States, the Bahama Islands contributed 492 cars, Porto Rico 13, Cuba 809, and Mexico 4,820.

While this represents the volume of field-grown tomatoes entering the markets of the United States, it must be borne in mind that, in addition to this, tomatoes for canning purposes were produced and packed in 1927 to the amount of 13,137,042 cases. But the tomato industry is not wholly confined to the plants grown out of doors. Tomatoes form one of the important greenhouse crops throughout the northeastern quarter of the United States, where extensive areas are covered by glasshouses for the purpose of producing vegetables of superior quality. In fact, this is the source of the tomato de luxe.

The increase which has been taking place in the production of some of the important vegetable crops during the last quarter century is very significant. The potato acreage in 1899 was 2,939,000, while in 1924 it was 3,327,000, an increase of practically 388,000 acres. But while there was only about 13 per cent increase in the acreage devoted to potatoes from 1899 to 1924, the production in 1924 exceeded that of 1899 by nearly 161,328,000 bushels. This is accounted for by the fact that during the earlier period the 10-year average production up to and including 1899 was 72.4 bushels per acre, while in 1924 the 10-year average had increased to 100.6 bushels, thus showing the trend which improved cultivation, better seed, and the utilization of more suitable areas for the production of potatoes has had upon this important industry.

Cabbage Acreage Doubled

During the same period the cabbage industry has practically doubled in acreage; the muskmelon industry has increased over one and one-half times; the lettuce industry, which, outside of greenhouses and local market gardens, was practically unknown, now occupies over 70,000 acres annually. The onion crop, which occupied less than 40,000 acres 25 years ago, now occupies 87,000 acres. The sweet-corn industry has increased from the neighborhood of 150,000 to over 400,000 acres. Tomatoes have also experienced a similar expansion; in 1899 less than 200,000 acres were devoted to the cultivation of tomatoes, and in 1924 over 420,000 acres were grown. Not only has this phenomenal increase in acreage production taken place, but the industries are so ordered that, in the case of tomatoes, lettuce, onions, cabbage, and to a lesser extent with potatoes, fresh products from some extensive producing centers are available every month of the year.

The conservation of vegetable products through the art of canning has largely developed during the period under discussion. In 1899 no more than 7,000,000 cases of tomatoes were packed, while in 1925 nearly 20,000,000 cases were prepared. The history of the pea-canning industry is still shorter. Prior to 1905 less than 5,000,000 cases were annually packed, but by 1925 nearly 18,000,000 cases were made available for consumption. The annual value of the cannery products alone amounts to approximately $277,346,574 at the present time.

These interesting features of agricultural production are chiefly confined to short-season annual crops. Space forbids a discussion of other crops grown both under glass and in the open on an extensive scale, both for marketing fresh and as canned products. The list might be extended to include cucumbers, peas, beans, spinach, kale, sweet potatoes, sweet corn, and numerous other less extensively grown vegetable crops. Suffice it to say that soil and climate alone do not produce these crops, and engines and cars unmanned do not transport them, but modern intelligence directing these natural and artificial agencies makes possible fresh vegetables on the American table in ever-increasing variety and quality 365 days in the year.

L. C. CORBETT.

VEGETABLES Graded and Bunched Find Increasing Demand

The standardization of bunched vegetables has shown rapid progress during the last few years. With the realization that graded products are always in demand the better class of growers and shippers are insisting that inferior stock be left at home.

The proper grading and packing of bunched vegetables at various shipping points has gone a long way toward increasing the consumption of these crops and, in conjunction with more efficient refrigeration in transit, has widened their distribution to such an extent that fresh bunched vegetables such as beets, carrots, turnips, etc., may be secured in any section of the United States during approximately nine months of the year.

With United States grades for various bunched vegetables as a basis on which to work, stronger efforts are being made to put up better packages of superior quality products which will have a direct appeal not only to the car-lot receiver, the jobber, and the retailer, but to the consumer as well. It is the housewife who must be given important consideration in any scheme which aims to increase the demand for a food product.

Appealing to the Consumer

Such factors as the proper sizing of bunches, uniformity of sizing of the individual specimens within the bunch, cleanliness and freshness of stock, and the general appearance of the lot are important things to be considered when appealing to the ultimate consumer.

If bunches are irregularly graded and sized, it is to be expected that early purchasers will pick over the lot and select the best. The remaining bunches are usually small or poorly graded, or, because of the frequent handling to which they have been subjected, present

an unattractive appearance. When all bunches are uniformly graded and well sorted as to size, this excessive rehandling with its resultant damage is unnecessary and the storekeeper is able to dispose of the last of his stock to advantage.

The grading of bunched vegetables has made great strides in a comparatively short time, but there are some sections which have been slow to change their practices to conform to market demands.

FIG 276—Bunch of carrots, A, of poor quality, irregularly sized and poorly graded B, of good quality, regularly sized, and well graded

The result is that much of their former trade is passing to more progressive sections where graded products may be more easily secured

WILLIAM E. LEWIS.

WAREHOUSE ACT Gives Canners a Basis for Efficient Financing With the large packs of tomatoes in 1924 and 1925 and the large packs of sugar corn and peas in 1924, 1925, and 1926, the canners of these products found surpluses accumulating in their warehouses. This resulted in financing difficulties which in turn resulted in price cutting. A great many small canners were being ruined.

Leaders in the canning industry thought the solution lay in holding goods off the market. But to do this required money, and many of the smaller canners could not get the necessary money at rates which they could afford to pay. Under pressure they were forced to liqui-

date. Every time some packer became distressed the market suffered still more. One of the difficulties in financing grew out of the fact that many of the canners had the goods stored in their own warehouses and were not in position to convert these goods into a form of collateral which their local bankers could pass on to rediscounting banks.

With the market becoming more demoralized, many of the leaders turned to the United States warehouse act as a means of help. Several canners' associations and their leaders requested the department to give serious consideration to placing canned foods (fruits and vegetables) on the eligible list for storage under this law. After considerable investigation and conference with members of the canning trade, in the course of which it was shown that favorable action would benefit the farmer, in August, 1926, the Secretary of Agriculture promulgated regulations providing for the storage of canned foods. Since that date a number of warehouses have been licensed and a number of applications are pending.

Of the eight products which have been placed on the eligible list since the amendment of 1923 to the law, which left it with the Secretary of Agriculture to determine what products might be stored under the law, canned foods apparently filled a greater need than any other, judged by the interest shown. Already warehouses for the storage of canned foods are licensed in Oregon, Utah, Oklahoma, Missouri, Arkansas, Illinois, Iowa, Wisconsin, Indiana, Ohio, Virginia, and Maryland. At the close of September 30, 1927, more than 2,000,000 cases of canned foods could be stored in licensed warehouses. Additional applications are coming in weekly.

Interest Rates Reduced

That a worth-while service is being rendered the canning industry through the warehouse act is evidenced from reports reaching the department, which indicate that loans supported by federally-licensed warehouse receipts are now being made on a 5¼ to 5½ per cent basis, whereas formerly it cost the same canners from 7 to 10 per cent and sometimes more when all charges incident to securing the loan were added. This cut in interest charges is significant, but the more important point is that with the proper financing fewer "distress" packs are hanging over the market, with results that can not be measured in dollars and cents. With the canners themselves taking a hand in controlling production and the assistance of the Federal warehouse receipt the market is improving materially.

Another interesting aspect of storing of canned foods under the warehouse act is the increasing interest on the part of the trade in national standards for the product. Under the warehouse act, except under certain conditions, the grade of the product must be stated on the warehouse receipt. Further, all products must be inspected before they may be placed in the licensed warehouse. This inspection alone is serving a useful purpose in the interests of both the consumer and the canner who wants to pack quality products. A statement of grade and condition of the product on the face of the warehouse receipt, or on certificates issued by licensed inspectors and graders and attached to the warehouse receipts, gives the receipt real collateral value in the eyes of bankers. Without such information no banker can tell what he can safely lend on a lot of goods.

Standards for Canned Goods

One of the factors which made financing so difficult in the past was the lack of a determination of grade and condition in accordance with definite standards. With a view to improving this condition, the department workers have been giving considerable attention to developing standardized grades for various canned fruits and vegetables. During the next year it is hoped to announce some definite standards which will be acceptable to all interests. The general use of these standards should make it possible for the housewife to buy a product according to its grade and not by brand names. It is believed that when the housewife can feel assured that she will always get the same quality by asking for a certain grade it will have a measurable effect on the market and result in greater consumption. If nothing more results, the use of standardized grades, rigidly adhered to, ought to eliminate many undesirable packs from the market.

H. S. YOHE.

WAREHOUSE-ACT Rule Makes Bulk Sirup a Storable Commodity

Cane sirup was made storable under the United States warehouse act in December, 1924. This action was in answer to demands of growers, dealers, and bankers who financed growers, growers' cooperative associations, and dealers. Only sirup in barrels or processed and placed in cans could be stored under Federal license.

By later amendment provision was made to store the sirup in bulk in large tanks. It required that like grades and kinds be placed in tanks having the same kind and grade and that the tanks be placed under refrigeration. Then those operating warehouses for bulk storage and depositors contended that it was not essential that sirup in tanks should be placed under refrigeration during the fall and winter months, the object being to save refrigeration costs, if possible, until the spring months. It was suggested by the department representatives that a test be made by actually carrying sirup through a season without subjecting it to refrigeration. Such a test was made of some of the 1926 crop. In August, 1927, department representatives who tested the sirup found it to be of as good quality as sirup which had been canned.

Following this test, it was ruled that cane sirup might be stored in bulk and in tanks located in rooms equipped with refrigeration, but that it would not be necessary to operate the machinery until such time as the licensed inspector might deem it necessary, provided that when refrigeration had been once applied it must be applied thereafter continuously, and in any event it must be applied not later than March 1 following the year in which the sirup was produced.

The storage of sirup under this ruling accomplishes two purposes: (1) It eliminates unnecessary refrigeration costs and (2) it makes it possible for producers to use the same barrel several times in the course of a season to make deliveries from farms to tanks, which is a considerable saving. The farmer brings his barrel of sirup to the warehouse, where it is inspected and graded by a person licensed under the warehouse act, and then the sirup is poured into a tank containing like kind and grade of sirup.

Cost per Gallon

A barrel of 34 gallons capacity costs $2.25 in the Georgia sirup-producing area, or about 7 cents per gallon capacity. If the same barrel is used three times the cost is about 2½ cents a gallon. By using the tanks for storage the same barrel may be used three, four, or even five times a season, thus reducing original package cost still more. In Grady County, Ga., about 35,000 barrels of sirup are produced each year. If the same barrel is used only three times in a season the saving in that county, if all sirup were handled in large tanks, would amount to about $53,500, which is a direct saving to the producer. This does not take into account any saving that might be made through the elimination of losses due to fermentation of sirup when not placed under refrigeration or any savings in arranging finances through the use of the Federal warehouse receipt.

H. S. Yohe.

WEATHER Lore in Folk Sayings is Often Reliable The weather makes or mars the crops. That is why the farmer is so interested in it. He no longer pays much attention to the predictions in almanacs or any other long-range fiction. To him the coming weather is a serious matter and he wants facts about it, not vague guesses. Fortunately his needs in this respect now are largely supplied by the forecasts of the Weather Bureau, but not all of them nor all the time. It frequently happens that he does not get these forecasts; besides, they necessarily are expressed in general terms and for a large region, such as a whole State. The farmer wants the forecast to apply to his particular farm and mainly for the next few hours. He therefore must rely on his own weather wisdom—wholly when he does not have the official forecasts and partially when he does have them. But the weather signs of the skies and their meanings are not the same for all countries nor even for all places in the same country. Among the mountains, for instance, there are some excellent weather signs that do not occur on the Plains and, on the other hand, some on the Plains that are unknown in the mountains. To be his own best forecaster, therefore, one must know intimately the region for which he is forecasting. However, there are some excellent signs that apply very generally and which every farmer ought to know; at least he ought to know the facts, whether he remembers the particular words in which they are expressed or not.

Shakespeare is Weatherwise

Here is an excellent one in the verse of Shakespeare:

> The weary sun hath made a golden set,
> And by the bright track of his fiery car
> Gives token of a goodly day to-morrow.

That is, when the sun sets in a clear sky the next day is likely to be fair. This is true, because it is fair weather at the time of the sunset, and fair weather usually lasts two or three days at least and generally longer than that in the summer and fall, when the farmer is busiest harvesting his crops.

On the other hand,

> If the sun set in gray
> The next will be a rainy day.

This is a pretty good guess, too, because a gray sky is one overcast with a high thin cloud, just the kind that runs well ahead of a general rainstorm. At such times the clouds commonly grow darker and denser until within 6 to 24 hours it begins to rain.

The following is a beautiful old saying about the rainbow:

A rainbow in the morning
Is the shepherds' warning;
A rainbow at night
Is the shepherds' delight.

As used here, "night" does not mean after dark, but late in the afternoon. This is not a very reliable sign, but it is worth something. A rainbow is seen only in a local shower of the thunderstorm type, caused usually by surface heating. Now, if a shower of this kind occurs in the early forenoon it certainly did not require much sunshine to start it, and there is likely to be enough sunshine later in the day to cause other showers. If no such shower occurred until late in the afternoon, then it must have been rather hard to start, and others are not likely to follow that night nor even the next day.

Rainbow Proverb Well Grounded

Besides, the shower that gives a rainbow in the morning is west of the observer—always on the other side from the sun—and the one that gives an evening rainbow east of him; therefore, since those storms nearly always travel more or less from west to east, a morning rainbow indicates that that shower, at least, is coming, while an evening bow is evidence that the rain producing it is going farther and farther away and will not return.

Sometimes the stars also give excellent hints of the morrow's weather. When they appear exceptionally bright and are seen in great numbers, it is certain that there is not much moisture in the air and that the next day is quite likely to be fair. But if they are dim and growing dimmer, we know that high thin clouds are gathering of the type that goes before a rainstorm, and the chances are that the next will be a rainy day. This bit of common weather sense, like many another, has been cast in proverb form:

When the stars begin to hide
Soon the rain will betide.

Lots of places have fogs, and those of summer and fall, at least and well inland, are good signs of a fair day. They are produced, when the night sky is clear, and as a general rainstorm commonly is preceded 6 to 12 hours and often longer by high thin clouds, a foggy morning hardly can be other than the beginning of a fine day. In short,

A summer fog for fair.

Also fog and cloud rising up a mountain indicate clearing conditions, but gathering rain when they settle lower. Paraphrasing a well-known proverb jingle, one might say:

When the mist creeps up the hill,
Farmer, out with plow and drill;
When the mist begins to nod,
Farmer, leave alone your sod.

Many Sayings About the Clouds

There are lots of sayings about the clouds, but the most reliable have already been mentioned or implied. There is one other, however, that is worth remembering; it is this:

In the morning mountains,
In the evening fountains.

This is only a poetical way of saying that if there are a lot of big cumulus or woolpack clouds in the forenoon, clouds that are caused by surface heating, they are likely to become larger during the day as the surface heating goes on, and by midafternoon one of them here and another yonder grow into a thunderstorm with abundant rain.

One of the very best indicators of the weather for the day is the state of the dew in the morning. It gathers on grass and other exposed objects when they cool enough to condense it out of the air, just as moisture is condensed out of the air onto the side of a pitcher when filled with ice water. Now, the grass and other outdoor things cool considerably only on still, clear nights, the kind that occur during a spell of fine weather and at no other time. Hence a heavy dew means that the air was still and the sky clear, at least during the latter half of the night. And it is pretty certain that if there was neither wind nor clouds during that time, the day will be a good one for all outdoor work. On the other hand, if there is no dew in the morning it is almost certain that either the sky was clouded or that there was appreciable wind, or both; and both, as a rule, precede a general rainstorm by 6 to 12 or even 24 hours, according to circumstances.

There is, then, much reason back of these two proverbs:

When the grass is dry at morning light
Look for rain before the night.

When the dew is on the grass
Rain will never come to pass.

This will do, perhaps, for the present and as illustrations, but there are hundreds of other weather sayings—a few, like the above, well founded and valuable, and many, though of lesser worth, still highly instructive, and, in addition to these, a far greater number utterly silly from the scientific standpoint and entirely useless, but interesting as bits of folklore and some of them beautifully expressed. Among the most absurd are those based on the tipping of the moon's horns (wet and dry moon), thickness of the goose bone, shadow cast by the ground hog, quantity of mast, thickness of fur, and numerous others.

W. J. Humphreys.

WEATHER Service for Commercial Aviators is Further Extended Although at the present time there is comparatively little relationship between agriculture and aeronautics, it seems certain that, as the art of flying develops and increases in efficiency and dependability, such relationship will become close and vital. Already a beginning has been made, as shown by the success with which cotton fields are dusted and forest fires are located by airplanes employed for these purposes.

Other ways in which agriculture will probably benefit include the quick transportation of perishable vegetables and fruits to market and of repair parts for agricultural equipment and other supplies for which there is urgent and immediate need; also the eradication or at any rate the effective control of insect pests and plant diseases which in many cases can be accomplished much more quickly and at less expense from the air than by the methods now employed.

Weather Information Indispensable

In order that aeronautics may in the fullest sense serve commerce and industry, including agriculture, it must become at least as dependable as other transport agencies, and experience has shown that one of the chief factors in this dependability is the development of an accurate and prompt system of weather reports and forecasts. The pilot about to start on a two to six hour flight must know what the weather is at his objective and at points along his route. In addition, and quite as important, he needs an accurate forecast of changes from present conditions that will occur while his flight is in progress. The weather elements in which he is most interested are fog and low clouds, because these make navigation and landing difficult. Close seconds to these are sleet, because of its weighting effect on the plane, and thunderstorms, squalls, gales, and heavy rain or snow. The pilot is greatly benefited also by information regarding upper winds, since this knowledge enables him to select the best altitude for his flight.

Recent Developments in Weather Service

In the early part of 1926 Congress passed what is known as the air commerce act of 1926, which assigns to the Secretary of Commerce the duty of encouraging and regulating the use of aircraft in commerce. Among other provisions of this act the Secretary of Commerce is authorized to develop and maintain suitable navigational aids, including weather reports, the latter to be furnished by the Weather Bureau of the Department of Agriculture. Shortly after the passage of this act funds were provided for an enlarged weather service, and the work of organizing it was begun in July, 1926.

This expanded service consists essentially of two main features: (1) The inauguration of pilot balloon observations at Weather Bureau stations on officially recognized commercial airways for the measurement of wind direction and velocity at various heights, and (2) the establishment of additional stations on those airways for the taking and transmission of special observations of surface weather conditions, including visibility, height of clouds, etc.

The observations, both surface and upper air, are made at such times as best fit the flight schedules on the airways. For example, a pilot just before he leaves New York for Cleveland receives a report showing the conditions prevailing at the latter place and at several points between the two. These reports indicate to him whether or not the weather is favorable at the time of take-off. At the present time they are transmitted by telephone, telegraph, or radio, whichever is most prompt and dependable. Eventually a uniform system of transmission will doubtless be developed, and the Department of Commerce is now working to that end.

Forecasts Also Furnished

In addition to the current reports the pilots receive forecasts for the period and route of their flights. These differ from the ordinary weather forecasts in that they are what may be termed short-range forecasts covering a period of 2 to 5 or 6 hours instead of 12 to 24 or more.

The airways along which flights are now being made on regular schedule are New York to San Francisco, New York to Boston, Cleveland to Pittsburgh, Cleveland to Detroit, Chicago to Detroit, Chicago to St. Paul–Minneapolis, Chicago to St. Louis, Chicago to Dallas, Cheyenne to Pueblo, Salt Lake City to Pasco, Salt Lake City to Los Angeles and Los Angeles to Seattle. Intensive weather service is being furnished to all of these airways and will be extended to others as rapidly as they are organized.

WILLIS RAY GREGG.

WEED Control Aided by Research at the Experiment Stations

Even the most conservative estimates show the losses due to weeds to be enormous. They reduce yields, restrict the tillable acreage, damage the crop, deplete the soil moisture and fertility, depreciate the quality of the product, harbor insects and parasitic fungi, increase the cost of cultivation, stop drains, irrigation ditches, and canals, reduce the value of wool and hides, and poison livestock. In short, they increase the cost of production, lower the quantity and quality of the product, and hence diminish the farmers' profits.

To offset these many bad points, weeds have comparatively little to offer. They may prevent erosion of uncropped land, hold snow, and delay the losses of fertility elements by leaching. They supply a certain amount of pasturage and are often the principal means by which organic matter is restored to the soil. These few benefits, however, can be obtained by proper crop rotations to much better advantage and without maintaining a permanent source of infestation.

The seriousness of the fact that extensive infestations in an adjacent or even distant State may be the ultimate cause of serious local outbreaks will be appreciated when it is remembered that weeds spread through the agency of the wind, water courses, and irrigation ditches, animals and birds, and by their own special characters—burs, appendages, creeping roots, etc. Man himself is a highly important factor in weed dissemination, spreading the pests by using impure agricultural seed, changes in the cropping system, by wagons, automobiles, and railroads, in hay and grain, and by permitting aggressive plants—e. g., Bermuda grass, chicory, or garlic—to escape from cultivation.

Increased Stress on Weed Control

Confronted by the depreciation of the productive capacity of his fields and contamination of his crops because of the spread of pernicious weeds, the farmer is making insistent demands on the agronomists and botanists of the experiment stations, State control boards, and of the United States Department of Agriculture for aid in controlling or eradicating the pests. As a result there has been renewed interest and activity on the part of the various agricultural research

agencies in a closer study of damage caused by weeds and its more effective prevention. What was formerly looked upon as a minor activity has in many cases now become a major subject of investigation.

Practically every experiment station must deal with one or more menacing weed pests. A scarcity of information on the control of a particular weed is often met with; likewise methods successful elsewhere will not always apply to the conditions found in a particular State or region. In this case the station must work out control methods proper for the locality. While much of the earlier work has been rather empirical, different methods being outlined and tried in the field, recent investigations have been based on thorough study of the life history and growth habits of the weed as well as of the infested crop.

Examples of Weed Control

A few examples of the weeds dealt with in recent studies by the experiment stations will show the scope of the problem and the progress made.

Control of the bindweed or wild morning glory, according to results obtained by the California, Kansas, Utah, and Washington stations, calls for frequent tillage about the time the top growth appears. Alfalfa and sorghum seemed promising smother crops for large areas, whereas small patches could be destroyed by salting, and continuous cultivation alone or accompanied by pasturing with hogs.

Iron Sulphate Checks Dandelion

For the control of dandelion in lawns the most effective of the methods tested by the Colorado and New York State stations was the use of iron sulphate sprays several times in the season, accompanied by proper management and correct application of seed and fertilizers. Hand weeding, however, continues to be more widely used than spraying.

From its experience with dodder in alfalfa, the Colorado station recommends for small infested areas cutting and burning the plants, followed by hoeing from 2 to 3 inches deep every few days for several weeks. On extensive areas the station suggests that the alfalfa be cut for hay before the dodder seeds, or if the seed is already mature the crop should be cut and burned and the land plowed and kept in cultivated crops for several seasons.

For the control of field hawkweed without permanent injury to Kentucky bluegrass the Virginia station, cooperating with this department, found applications of either sodium arsenite, sodium nitrate, salt solution, or dry salt to be effective.

Wild garlic, according to the Indiana station, can be destroyed by deep fall plowing so as to turn the garlic tips completely under, followed by early spring plowing and planting to such cultivated crops as corn or soy beans in rows. This procedure must be continued for at least three years.

The quickest way to rid land of Johnson grass, according to the Arizona station, is to overgraze with sheep, meanwhile irrigating often, although frequent cultivation of a late summer crop—e. g., corn, followed by another crop, such as cotton, demanding much tillage—seemed the most effective and economical. The New Mexico

station states that clean summer fallowing with frequent shallow cultivations with a knife cultivator will eradicate Johnson grass in one season. Other States advocate somewhat different methods to meet local conditions.

Weeds in Rice Fields

The control of weeds in rice fields has been studied by the California and Louisiana stations cooperating with the department. Control of barnyard grass, the worst weed in California rice fields, was secured by hand pulling, cultivation during fallow years, and continuous submergence from seeding until the rice field is ready to drain. Red rice and other weeds in Louisiana rice fields were controlled and even eradicated by rotating the rice crop with soy beans.

The rapid spread of perennial sow thistle in the Red River Valley of the North threatens to bring about far-reaching changes in the

FIG 277.—A weedy fence row One way by which weeds are spread

cropping systems of North Dakota grain farms, including proper crop rotations, thorough tillage, and pastures plus livestock. Observations and experiments by the North Dakota station and extension service indicate that prevention of leaf and top growth by repeated surface tillage is one of the feasible means of eradication. Mowing about every three weeks from July 1 to frost and cutting the flower stalks as soon as flowers open is another control method.

An especially vicious plant studied in California, the puncture vine or caltrop, is controlled by cultivation in the seedling stage and later. Sprays of light fuel oil are said to be very effective in controlling the weed on untilled land.

Canada thistle was completely eradicated, without injuring grass in which it was growing, by a heavy fall application of sodium chlorate (10 per cent solution) spray in experiments at the New York Cornell station. Sprays of both sodium arsenite and calcium arsenite gave promising results on pasture heavily infested with Canada thistle in experiments at the Ohio station. Alfalfa in localities suited to its vigorous growth is an effective smother crop.

The most practicable means of controlling white top, a serious weed in meadows and grain, was found by the Indiana station to be clipping, grazing with sheep, early cutting of infested hay, and mowing untilled lands at least two or three times during the season.

The poisonous plants of the range, such as whorled milkweed, loco weed, death camas, water hemlock, and many others, cause heavy losses of livestock, but discussion of their control and eradication does not come within the scope of this article.

Weeds Harbor Plant Diseases and Insect Pests

The important part that weeds play as harborers and hosts of plant diseases and insect pests is a phase of the subject which is receiving particular attention at the present time and represents one of the newer developments in this field of investigation. The Texas station has shown that Texas cotton root rot can probably be controlled by eliminating the perennial morning-glory, on which the disease over-winters. The Kentucky station is attacking the problem of eradicating bull nettle and several species of ground cherry, common weeds in the tobacco fields, which carry over winter the mosaic disease of tobacco. Investigations by this department in Illinois and Wisconsin have shown that mosaic disease of cucumbers can practically be controlled by elimination of pokeweed, milkweed, ground cherry, and wild cucumber.

Preventive Measures

Various useful preventive measures, such as thorough preparation of seed beds, use of clean seed, proper cultivation, crop rotations, and summer fallowing, have grown out of the experimental work with weeds. Mowing, pasturing, smother crops, covering, burning, chemical sprays, and intensive cultivation, singly or in different combinations, have been recommended and used with success for active weed infestations.

Sources of Information

Investigations on various important phases of weed control are now in progress at a number of the experiment stations, and useful information on a wide range of weeds has been given out by several of the experiment stations and this department. The close contact of the stations with conditions in their respective States enables them to give detailed advice and render particularly effective aid in solving local weed problems.

HENRY M. STEECE.

WHEAT Factors that Lower Milling Value Often Controllable Grain-inspection statistics show that a large proportion of the wheat shipped from country points to terminal markets and inspected and graded under the United States grain standards act fails to meet the requirements for the best grade. Figure 278 shows the percentage of car-receipt inspections of the 1926 crop grading in the various classes and numerical grades. Combining all grades below No. 1, it is found that 59.8 per cent of the wheat inspected failed to meet the grade requirements of No. 1 wheat. In addition to being affected

as to numerical grade, many of these lots, including those grading No. 1 as well as those of lower grade, were designated as "weevily," "smutty," "garlicky" and "treated" or they carried a "dockage" notation.

The factors that make wheat grade below No. 1 and the side notations vary considerably in relative importance. The most important ones, in point of number of inspections affected, are test weight per bushel, moisture content, damaged kernels, dockage, foreign material other than dockage, mixtures of classes, weevils and other insects injurious to stored grain, smut, and garlic.

During the last eight years, four of these factors (smut, dockage, foreign material other than dockage, and garlic) have been increasingly recurrent. They are preventable yet are annually costing the producers of wheat millions of dollars.

The grade assigned to wheat is recognized by the grain trade as an indicator of its condition and quality; consequently, the producer of wheat that grades No. 2 or lower, or which is given a side notation, receives a lower price than if his wheat had graded No. 1 and carried no side notation.

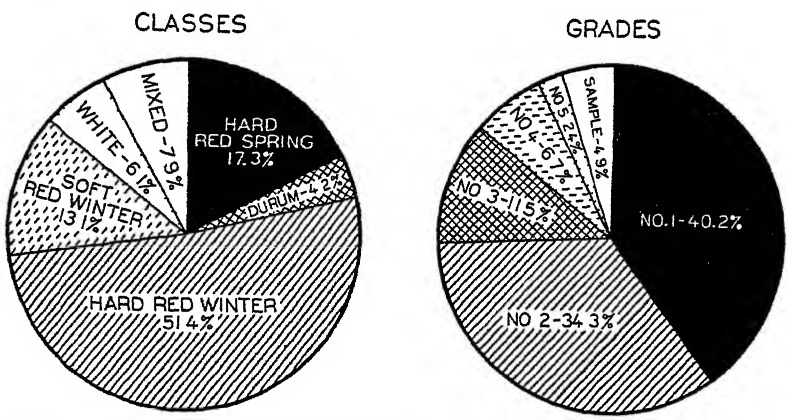

FIG 278 —Combining all grades below No 1, practically 60 per cent of the inspected wheat failed to meet the grade requirements of No 1 wheat

The factor responsible for the greatest number of inspected wheat which graded below No. 1 is test weight per bushel, over which the producer has little, if any, control. It is a measure of the plumpness and density of the kernel. It is closely related to the flour-yielding capacity of the wheat and to the proportion in which the various grades of flour will be present. Wheats of high test weight, other factors being equal, not only contain a greater quantity of potential flour but also contain a higher proportion of the higher grades of flour.

Moisture content as a grading factor receives serious consideration by the grain trade because of its influence upon keeping qualities. Moisture content has also a direct relation to food value, which is directly proportional to its dry-matter content. The moisture content of the wheat, as marketed, is usually dependent upon the maturity of the wheat, weather conditions at harvesting time and during the period between harvesting and threshing, and upon the extent and manner of exposure to these conditions. The exercise of care during this period often prevents high moisture content.

Degrees of Damage Recognized

Three degrees of damage are recognized in the standards for wheat; heat damage, damage other than heat, and distinctly low quality. The first two apply to the individual kernels and the last to the wheat as a whole. Damaged kernels include sprouted, frosted, scabby, blighted, bleached, weathered, fungus infected, mouldy, weevil cut, and heat damaged kernels. These forms of damage seriously affect the milling and baking qualities of wheat. The seriousness depends upon the kind and quantity of damage present and the degree to which the individual kernels are affected. This is provided for in the standards. In most instances, any appreciable quantity of damage is the direct result of careless or improper harvesting or storage methods.

Dockage in connection with grade applies to that portion of the foreign material present in wheat which can be removed readily by appropriate sieving and screening devices. Designation of the quantity of dockage present, together with the grade, serves as a convenient and fair basis for the evaluation of the wheat. Ordinarily in the purchase of wheat full deduction in weight is made for the percentage of dockage so designated. Because it is removed from the wheat before milling it does not affect milling and baking qualities.

The principal objection to dockage is that it adds to the harvesting, threshing, handling, and transportation costs without increasing the commercial value of the wheat. These are items which directly affect the producer's pocketbook. Losses from this source may be reduced by the removal of dockage on the farm. As the dockage may be utilized for feed it is of value to the farmer. Dockage is most abundant in the spring-grown wheat. The amount of dockage has in general been increasing each year.

Foreign material other than dockage is difficult, and in some cases impossible, to remove. This type of foreign material may affect the cost of placing the wheat in suitable milling condition or may affect its milling and baking quality, depending upon whether the miller is successful in removing it from the wheat. The standards provide limitations as to the quantity of this type of foreign material allowable in the various grades.

The sowing of clean seed wheat and the application of cultural methods which will retard or prevent the production of weeds in wheat fields will reduce the quantity of wheat affected by this factor. Material of this kind is found most frequently in spring and durum wheats.

Effect of Mixing of Classes

Mixtures of classes may affect either the classification of the wheat or the numerical grade, depending upon the extent of the mixture. The chart shows that, of the 1926 crop, 7.9 per cent of the wheat inspections were classified as mixed wheat. No data are available to show the number of inspected lots of wheat which graded below No. 1 on account of this factor. These mixtures occurred chiefly in the wheats produced in the durum wheat area and in the Pacific Northwest. Mixtures of wheat classes are discriminated against because the differences in the physical and chemical characteristics of classes affect their adaptability for different uses and require the employment of different milling methods for the production of best results. These

factors can be eliminated by the sowing of pure seed and the handling of each class of wheat separately.

Smut in wheat is of frequent occurrence and is apparently on the increase. Because of the difficulty of removing it and because of its possible harmful effect on the flour, smut lowers the market value considerably; the market discounts for such wheat usually range from a few cents to 20 cents or more per bushel. Smut may be prevented by treating the seed with certain chemicals. One method of treatment recommended is that of dusting the seed with copper-carbonate dust.

Weevily wheat is wheat infested with live weevils or other insects injurious to stored grain. The losses resulting from this factor are considerable. These insects, which multiply rapidly in warm weather, eat the center portion of the wheat kernel and in other ways seriously damage the grain. Sometimes they make it unfit for milling purposes. Proper fumigation of infested grain kills these insects. It should be done as soon as possible after the wheat becomes infested.

Garlic is a factor of considerable importance in the grading of soft red winter wheat but is almost entirely absent in other classes of wheat. The quantity of wheat affected by it and the area of infestation appear to be on the increase. Its objectionable odor is difficult to eliminate and the bulblets tend to clog the corrugations of the break rolls used in milling. It has been demonstrated that through planting of clean seed and the use of proper cultivation methods this weed can be eradicated.

J. H. SHOLLENBERGER.

WHEAT Harvesting by Combine Advantageous Under Right Conditions

The constructional features and the method of separation in the threshing unit of the combined harvester-thresher are the same as in a stationary thresher, yet it is only in the last few years that crops other than wheat have been harvested with the combine. The acreage of wheat harvested annually with the combine exceeds the total acreage of all other crops harvested with combines. Many farmers have used the combine successfully for harvesting such crops as flax, oats, barley, rye, and emmer; for grain sorghums and soy beans, and for sweet and other clovers.

When harvesting wheat, a properly adjusted combine loses less grain than do binders and headers. Based on a yield of 20.4 bushels per acre, losses resulting from the different methods of harvesting in several Great Plains States showed an average loss of 2.6 per cent for combines, 3.3 per cent for headers and 6.1 per cent for binders. In wheat with extremely short straw the combine saves the bulk of a crop which it might be necessary to abandon if only a binder were available. In tests made to determine threshing losses, stationary threshers lost an average of 1.1 per cent and combines 1.9 per cent, but many of the combines showed no greater loss than did threshing machines.

Small grains other than wheat are harvested satisfactorily with a combine and show lower field losses than when harvested with binders or headers. The threshing losses on machines tested, with few exceptions, run higher than do the wheat losses. To a great

extent this is due to the inexperience of the operator in properly adjusting his machine to separate the grain.

Grain sorghums, although handled with fair satisfaction under certain conditions, show rather high field and threshing losses. Before the combine will be completely adapted to handling this crop certain changes in design and construction will be necessary.

Farmers who have harvested sweet clover with a combine state that they have secured better results than with any other method as little seed is lost in harvesting and threshing. Red, alsike, and giant English clover have been successfully harvested and threshed.

Other Uses of the Machine

In Kansas and Oklahoma many farmers who harvest their grain-sorghum crops with headers or row (corn) binders, thresh the grain later with the machine. The same is done by other farmers who have small acreages of grain other than wheat, and who wish to save the straw for feeding or bedding. If considerable use is made of the combine as a stationary thresher, an extension feeder and straw carrier add to its efficiency.

The maximum acreage which a combine can handle in a season is dependent upon the size of the machine, length of the harvest season, and crops to be harvested.

With a combine, the harvest season begins from 7 to 10 days later than with a binder, to allow the grain to mature so that it will keep in storage. New operators consider the risk from hail and wind to be rather great during this interval but experienced operators give little thought to the delay as they consider the possibility of crop loss slight.

Actual time spent in harvesting a given acreage with a combine is considerably less than with a binder or header. A 10-foot combine should harvest and thresh about 26 acres of wheat yielding 20 bushels per acre in about 10 hours, and a 15-foot machine should cover 35 acres. With an 8-foot binder about 16 acres would be cut and with a 12-foot header about 25 acres. In making a comparison the time required for harvesting with the binder and header must be added to the time required for threshing the crop.

The length of the harvest season is dependent upon weather conditions in different areas. In cases where the season has been prolonged because of inclement weather, little loss has occurred from shattering and lodging.

When there is a heavy infestation of weeds and they are high enough to be cut off, work with the combine is seriously hampered. Some weeds cause trouble on the platform and as they enter the cylinder, but the greatest trouble occurs in the separating mechanism.

Trouble from Russian Thistle

In the northern Great Plains the Russian thistle causes trouble by choking the tailings return and the grain elevator and it is impossible to separate the green tips from the wheat. These tips often so raise the moisture content of the threshed wheat that it will heat when put in storage. Flax fields that are badly infested with thistles show threshing losses that run between 10 and 15 per cent, whereas clean fields harvested with the same make of combine frequently run less

than 1 per cent. Mature sunflowers plug the machine, causing high threshing losses, especially in barley and oats.

Rainy periods during the harvest season are of such short duration or are so intermittent in most years that there is little interference with harvesting in the areas where combines are now in use. Humidity causes little delay, as wheat in condition to combine does not absorb the moisture readily enough to raise the moisture content of the grain above a point considered safe for storage. Losses caused by hail damage are but little if any greater to grain which is combined than to grain cut with a binder or header.

In sections to which it is adapted, the combine provides a more economical method of harvesting and threshing than either the binder or the header. The lower harvesting costs made possible by the use of the combine undoubtedly constitute the principal reason for the growing popularity of the combine. The actual cost of harvest and threshing is only one of the factors to be considered in comparing methods of harvesting and threshing.

Allowing the customary rates of payment for the use of the tractor, labor, fuel, and repairs on machines, the per acre charge for harvesting and threshing with a combine would be approximately $1.50 as compared with $4.22 where a binder was used or $3.36 where a header was used. To this figure a charge for replacement of the machine and interest on investment should be added.

First Cost is High

The high first cost keeps many farmers from buying a combine. Prices of combines range from about $1,000 for the small size to $3,000 for the larger units. The average length of service of machines as estimated by farmers is eight years. With this period of service, the annual replacement charge would be $160 for a 10-foot combine at the average purchase price of $1,260 or would be $260 for a 15-foot combine costing $2,080. The annual replacement charge would be about $22.50 for a binder, and for a header, about $13.30. The interest charge is proportional to the purchase price. Repair expense on machinery is higher for the combine than for other machines.

Within the range of the acreage normally harvested by a combine the acreage cut has little effect on the life of the machine or on the annual depreciation charge. Consequently the combine must be used to cut a larger acreage than is often cut with a single binder before harvesting costs will be reduced. For very small acreages the binder or header proves the cheapest method of harvest.

Assuming charges for man labor, horse work, fuel, twine and repairs, and for use of the tractor, and for depreciation and interest, the per-acre cost of harvesting and threshing with a 10-foot combine would be less than the cost incurred by using a binder and stationary thresher when 60 or more acres are to be harvested. Compared with the header method the small combine should reduce costs if 100 or more acres are to be handled. The larger 15-foot combine should be more economical than the binder if 100 or more acres are to be cut, or more economical than the header to harvest 150 or more acres.

The per-acre cost of labor and fuel for harvesting and threshing was practically the same for the large as for the small combine, and the advantage of the small combine on a small acreage is due to the

lower replacement charge. On larger acreages, where the machines are used to full capacity, this advantage of the small combine over the large one tends to disappear.

Cash Outlay at Threshing Time

Growers who have no alternative use for their man and horse labor may not consider the charges for man labor or horses as a direct cash expense. For the farmer who has sufficient horses, and has the use of the labor of two men and who has the opportunity to exchange labor at threshing time, the direct cash outlay for harvest and threshing would probably be greater for a small combine than for a binder or header unless 100 or more acres were to be cut. As compared with the larger combine the direct outlay would be less for the binder up to about 200 acres, or the capacity of the binder.

The per-acre cost of harvesting with a combine is little affected by differences in yield of grain except in cases where yields are very heavy and where the rate of travel or width of the swath must be reduced. Where a binder or header is used, and the grain is threshed at custom rates, the acre yield has a direct effect on total costs per acre. For yields of 15 to 30 bushels per acre the combine would have a greater advantage than for lower yields.

R. S. Kifer and
L. A. Reynoldson.

WHEAT Harvested by Combine Needs Quick Cleaning When Weedy

Until recently only a few combines have been operated in the spring-wheat area of the central Northwest, but in 1927, with 100 combines already operating in the area, nearly 400 additional combines were bought by farmers in this area. Slightly over 200 of these combines were operated in North Dakota in 1927.

The principal drawback to the use of the combine in the spring-wheat area is the presence of large amounts of weeds in the fields, as most of these weeds and their seeds with the exception of wild oats, contain high percentages of moisture at the time the grain is harvested and threshed with a combine.

The amount of dockage found in the grain grown in this area has in general been increasing. The wheat of the 1926 crop delivered to country elevators in the four principal spring-wheat States of North Dakota, South Dakota, Minnesota, and Montana contained on an average 7 per cent dockage. The wheat of this crop in North Dakota alone contained an average of over 9 per cent dockage. The average dockage in the 1926 crop of flaxseed was over 16 per cent.

As nearly every foot of soil in the spring-wheat area contains many viable weed seeds, the operators of combines will have the weed situation to meet for many years to come. By the old method of binding and shocking the grain the weeds in the grain dried out considerably in the shock and the moisture hazard was greatly reduced. To cut grain satisfactorily with the combine it is necessary that the grain be dead ripe and that it be allowed to stand in the field from a week to 10 days longer than is necessary for cutting with a binder. The delayed harvest means that many of the weeds such as lamb's-

quarter and pigeon grass develop more seeds which are threshed out by the combine together with the grain.

It was found in experiments conducted in North Dakota in the summer of 1927 that the weed seeds in some lots of combined grain at the time the grain was delivered from the combine contained over 60 per cent of moisture as against a moisture content of only 14 per cent in the wheat itself. When such wheat is cleaned before it is put into storage, it will have a moisture content low enough for safe storage, but when it is stored without cleaning the excess moisture in the weed seeds transfers rapidly to the wheat kernels, and fermentation is likely to occur. Fermentation in wheat in storage results in "heat-damaged" grain. Heat-damaged grain not only seriously injures the germination qualities of seed grain, but such grain also usually takes a heavy discount when the grain is sold on the market.

Early Cleaning Required

To prevent the wheat kernels from absorbing the excess moisture in the weed seeds, the grain must be cleaned either before or immediately after the grain is put into storage in the granary or elevator bins. This is particularly true if the weed seeds are present in large quantities. This transference of moisture from the damp weed seeds to drier wheat kernels is very rapid. It was found that where wheat had been delivered from a combine into wagon boxes and the grain had been held in the wagon boxes over night that by early next forenoon much of the excess moisture in the weed seeds in the grain had transferred to the wheat kernels. As the result of tests made on over 200 lots of combined grain in storage in farmers' bins in North Dakota in 1927, it was found that at the end of 48 hours the wheat had absorbed enough moisture from the weed seeds so that the moisture in the wheat and in the weeds was about equal.

It is evident from these investigations that the use of the combines for harvesting wheat and other grains containing green seeds will be most successful only when either cleaning appratus is installed on the combine to remove the weed seeds from the grain as it is threshed or when arrangements are made for cleaning the grain immediately after threshing.

Hourly samples taken from the standing wheat in the field indicated that the wheat kernels contained around 18 or 19 per cent of moisture early in the forenoon and that the kernels dried, under good drying weather, until late in the afternoon, when the wheat kernels had a moisture content under 14 per cent, but that at sundown the wheat again rapidly took on moisture from the damp air, increasing during the night to around 18 or 19 per cent of moisture according to the humidity of the air.

Some of the most successful operators of combines in the spring-wheat area make a practice of delaying combining until about 11 a. m. and then operating the combine without stopping until about 15 minutes before sundown.

Storage in Ventilated Bins

If it is found necessary to cut wheat when it contains an excess of moisture, any wheat with only a slight excess of moisture can usually be safely stored in properly ventilated bins.

Several bins equipped with ventilators placed close together were used for storing grain on the North Dakota farms in the 1927 experiments and grain with 16 to 18 per cent of moisture was successfully kept in these bins when the grain was cleaned before being placed in the bins. In these experiments similar combine threshed wheat from the same fields, which contained an equal amount of moisture, but which also contained from 3 to 8 per cent of dockage, was placed in adjoining nonventilated bins without cleaning, and these lots soon began to heat, particularly in those portions of the bins where most of the weed seeds were concentrated.

Farmers using combines should make provision for having their grain tested for moisture. They can buy Brown-Duvel moisture testers for use on the farms or can submit samples of the grain to operators of local country elevators for moisture tests. A few moisture tests of the combined grain, if made at the right time, often save farmers heavy losses.

R. H. BLACK.

WHEAT Heating May be Checked by Care in Stacking or Storing When wheat with excessive moisture is stored, it ferments with the formation of heat. If the mass of grain is sufficiently large and there is no loss of heat by radiation, the temperature of the bulk rises as the fermentation process proceeds.

Depending upon the intensity of the heat of fermentation, the wheat kernels become darkened in color, their gluten content is weakened, and finally the wheat becomes unfit for human consumption.

In recent years much damage to wheat has been caused by stacking bundles of green or wet wheat, or by threshing such wheat when too green or too wet and storing it in bulk. Wheat that has been discolored in the bin by the development of heat of fermentation is usually termed bin-burned wheat. When the fermentation takes place in bundles or in header-stacked wheat, the term stack-stained, or header-damaged wheat, is usually applied.

In certain years heat damage to wheat is especially prevalent, as in 1921 and 1922, when the annual total loss caused by heat-damaged wheat was far in excess of $2,000,000. The difference in price per bushel between sound wheat and wheat damaged by heat usually ranges between 5 and 15 cents per bushel. During one six-month period, when arrivals at Kansas City were under observation, the estimated loss in that market alone was over $220,000.

Speculation has always prevailed as to the milling and baking quality of damaged and discolored wheat. Discussion has been especially keen as to how the various types and colored kernels vary in milling and baking value. Investigation has shown that wheat kernels that are discolored to the shade popularly known in the grain trade as "skin-burned" (light-brown color) are of inferior milling quality.

This is particularly true if this type of kernel is found in country shipments before it has been mixed at an elevator, for less than 0.5 per cent of skin-burned kernels in country-run wheat is fair evidence that the milling and baking quality of the whole lot has been injured. The so-called sound wheat, in which the heat-damaged kernels are

present, is not really sound wheat, but is in a "sick" or weakened condition.

One per cent of skin-burned wheat, or 0.5 per cent of badly bin-burned wheat, when mixed with sound wheat injures the milling and baking qualities of the sound wheat.

Badly Stacked Wheat Inferior

Wheat that is badly stack stained is of inferior milling quality, inasmuch as it usually gives a low yield of flour and the flour has a high ash content. The bread made of such flour has a poor color, a bitter taste, and an undesirable weedy odor. The more severely discolored the kernels the more inferior is the resulting flour and bread. Stack-stained wheat, although at times as badly discolored as bin-burned wheat, is not as seriously injured as is bin-burned wheat of the same color. Stack-stained wheat does not carry well in storage under slightly abnormal conditions, nor does the flour milled from it store well.

The condition of the grain at the time it is stacked or stored in bins is more responsible for heat-damaged kernels than are the methods of harvesting and threshing. Early harvesting reduces the risk of damage to the standing wheat, but threshing should be delayed until the grain is dry enough to store safely. Moist wheat should be kept cool and well ventilated. Ventilators placed in the grain stored in bins are helpful, but it has not been definitely determined how much ventilation should be given to avoid heating of wheat that has an excessively high moisture content. It is advisable to delay threshing until the moisture content is well below 15 per cent.

D. A. Coleman.

WHEAT Output Grows Through Survival of the Fittest Strains

Wheat bread and milk have been from earliest times the staple foods of the world's dominant races. Fear of shortage of wheat has been voiced by economists and statisticians for many years, especially since Malthus and Crooks called attention to the greater rate of increase of wheat-using population as compared with wheat production. They overlooked, however, several important facts that must be considered in this connection:

(1) That the area that can be devoted to wheat can be greatly enlarged by the better adjustment of varieties to soils and climatic conditions.

(2) The development by breeding of varieties resistant to rust, smut, and insects and other pests.

(3) The development of higher yielding varieties.

(4) Increased production through improved cultural methods, fertilizers, and machinery.

(5) Prevention of losses in storage.

(6) The effect of better prices in increasing production.

Few if any one at the time of Malthus realized the great possibilities in each of these directions of meeting the increased need for wheat.

Predicted Shortage By 1930

The time when the world wheat shortage was to come was estimated by Crooks to be about 1930. That date is near at hand, but we are apparently further away from famine danger than ever. This is due in part to contributions in all of the six fields mentioned, but especially to a discovery that was announced about the same time as the Malthus theory—viz, the theory of natural selection by Charles Darwin and Alfred Russel Wallace.

This theory was based on a most careful study of plants and animals under domestication, as well as in their wild state. It was evident to any careful student of facts that plant and animal breeders have been able to gradually modify species and genera to an extent sufficient to place them in entirely new catagories. They did it through hybridizing and selection. Though they knew little or nothing of the fundamental laws involved, they laid the foundation of plant and animal breeding .

Darwin conceived the idea that limiting factors in environment might act as selective forces in nature. The plant or animal best adapted to overcome certain limiting factors would be the one to survive. He called this the "survival of the fittest." For example, if a large number of individuals were exposed to drought or cold the more tender ones would be weakened or destroyed, while others possessing greater ability to withstand drought or cold would survive. The same would be true regarding all other limiting factors of environment.

Influence of Mendel's Discovery

He found a great number of illustrations of this process, enough to set the whole biological world at work on the various aspects of the theory. As a result a great body of knowledge on the evolution of living organisms has been gained and some of the laws governing the evolutionary changes have been formulated. One in particular, discovered by an Austrian monk, Mendel, on the inheritance of unit characters, enables us to make hybrid combinations and select to pure fixed strains in a few years, whereas before his discovery was made, and understood, which latter was about a half century after it was made it frequently took many years to secure fixed strains.

It is sufficient for my purpose here to call attention to these facts as a foundation for the story of how they were used to lay the basis for solving some aspects of the wheat problem in America. Among the outstanding limiting factors to wheat growing in the United States are: (1) Black stem rust, which is generally distributed, but which causes the greatest losses in the middle western wheat belt; (2) the effect of drought in the wheat belt west of the one hundredth meridian; and (3) the effect of winter-killing in the northern part of the winter-wheat area.

In 1894 the Division of Vegetable Physiology, now a part of the Bureau of Plant Industry, began a study of the American wheat problems, especially the problem of rust resistance. This rapidly grew into a study of the basis for improvement of American wheats. A report on the rust phases of the work was published by M. A. Carleton as Bulletin No. 16, Division of Vegetable Physiology and Pathology, United States Department of Agriculture, 1899, and in

1900 a bulletin by Carleton, on the basis for the Improvement of American Wheats was published, which laid the foundations of the department's program for wheat improvement.

Method of Selection

The good and bad characteristics of each of the varieties grown and tested were discussed and the lines to be followed in securing improved varieties were clearly outlined. Carleton states:

"In general, regions possessing black prairie soils and characterized by violent climatic extremes, especially extremes of heat and drought, produce wheats that are hardiest, have the hardest grains, and are the best in quantity and quality of gluten content.

"Considering all qualities, the best wheats of the world are of Russian origin, coming particularly from eastern and southern Russia, the Kirghiz steppes, and Turkestan."

Among these the best known are Turkey, Crimean, and Odessa of the ordinary bread types, and Arnautka, Kubanka, and Mennonite of the durum types.

Somewhere in this general region, probably to the south, was the original home of wheat. Mr. Carleton concluded that a study of wheats in this region might yield something of value. Seed of known varieties had frequently been imported and had proved of great value. It was Mr. Carleton's idea, however, to go out into the small prairie settlements, far away from the big markets, and find wheat that had been grown for many years under extreme conditions of drought and cold, so that natural selection would have had full opportunity to get in its work without the interference of mixture of varieties as would be found in the more settled areas.

Mr. Carleton's plan appealed to the department officials, and he was sent in 1899 to make a study of these areas and to secure seed of such varieties as appeared to have promise. He made a very thorough exploration, especially in remote districts, where he secured a large number of selections in accordance with his plan under conditions where he was assured that the limiting factors of environment had had unrestricted opportunity to weed out nonresistant individuals, thus resulting in building up high resistance to cold and drought and other limiting factors.

Grains Grown for Centuries

On his return from this trip Mr. Carleton told the writer that he secured selections of wheat from communities that had grown the particular strain through many hundreds of years without bringing in any seed from outside. Some years they would have very little to eat, as they must always save enough for seed. If cold or drought destroyed most of the crop, what was left was very carefully saved for seed.

This was the "survival of the fittest" to live under these conditions.

These introductions were tested by the department in cooperation with the experiment stations of the Middle Western States. Some of the selections proved to be very well adapted to the drier areas west of the one-hundredth meridian, especially strains of the durums,

like Kubanka, Velvet Don, and Yellow Gharnovka. These wheats yielded largely in excess of the ordinary varieties and proved to be a safe crop where the ordinary varieties could not be depended on or grown at all.

By 1903 about 10,500,000 bushels of these durum varieties were produced in the Dakotas alone. Since that time selections have been made, like Nodak and Mondak, pure lines from Kubanka, but more resistant to stem rust and higher yielders; Akrona, a selection from Arnautka, an early high-yielding amber durum. The annual production for the Dakotas, Minnesota, and Montana is around 50,000,000 to 80,000,000 bushels, largely export.

Varieties of hard red spring wheat have been developed by selecting and breeding which are proving more cold, rust, and drought resistant and of better quality. Selections and hybrids of the hard red winter class, such as Kanred, Karmont, Newturk, and Minturki, have greatly extended and improved winter wheat. It may be safely said that these new introductions of specially selected varieties have formed the basis of a constantly improving wheat culture in the middle western area. Improvements will continue for many years to come as the art of combining valuable characters by breeding becomes better understood.

A. F. WOODS.

WHEAT Protein Is Increased by Using Nitrate at Heading It is now generally recognized that the protein content of wheat is a matter of the greatest importance. Wheat high in protein not only furnishes the consumer with more of this food element, but generally produces a flour with superior baking qualities. Premiums are accordingly paid by millers for grain containing an excess of protein over a certain minimum. During 1927 this premium reached as high as 15 cents per bushel for each per cent of protein over 12. At present climatic conditions principally determine whether the wheat in a given area in any one year will be rich or poor in protein; but if any means of intentionally increasing the protein content could be devised it is obvious that both producer and consumer would benefit.

Investigations conducted by the crop chemistry laboratory of the Bureau of Chemistry and Soils have shown that it is possible to increase the protein content of winter wheat one-third or even more through the application of sodium nitrate to the field when the wheat is heading. Applications made at an earlier stage in the growth of the plant have less effect on the protein content, but increase the yield of grain. The most advantageous procedure would therefore appear to be to apply sodium nitrate both in early spring and again when the heads of grain are becoming plainly visible.

Wider Spacing Feasible

When wheat is planted with the usual distance of 8 inches between the rows, it is necessary that at least the second application suggested be made by hand; but as this may not be economical when carried out on a large scale, studies have been made of the possibility of planting the wheat in more widely spaced rows between which a fertilizer spreader may be driven. It has been found that when the wheat is

drilled 2 feet apart and the weeds which come up in the spaces between the rows are destroyed by cultivation in early spring, the plants tiller out to such an extent that the yield of grain per acre is not materially diminished, and appreciable saving in seed wheat results.

That the wheat obtained from areas treated with sodium nitrate in the manner recommended is superior to that from untreated portions of the same field can be shown in various ways. The condition known as yellow berry is avoided, and the grain obtained from the treated areas is darker than that obtained from untreated land. Although it often happens that in wheat which contains a high percentage of protein as a result of special climatic conditions the kernels are shrunken, in the wheat which is obtained by applying nitrate at heading time the kernels are just as plump and yield as much flour as normal wheat. Chemical analysis shows that these

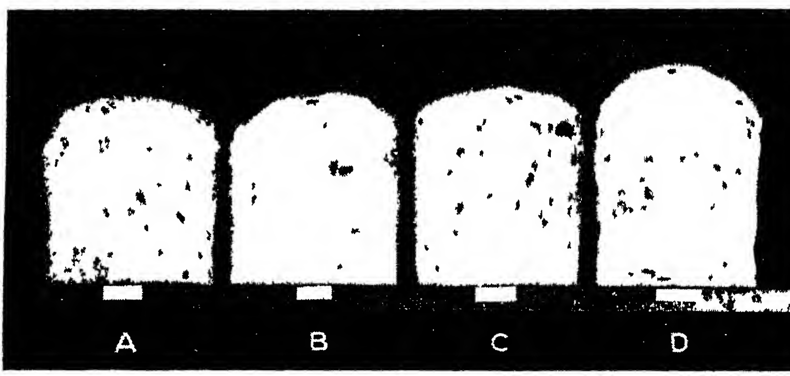

FIG 279 —Loaves of bread baked with flour obtained from wheat which was grown on four different experimental plots, with the usual 8-inch spacing of the rows From left to right these represent A, a plot to which no fertilizer was added, B, one to which sodium nitrate was applied in the all, C, one to which the application was made in the early spring, and D, a plot to which sodium nitrate was applied at heading time An improvement in quality from left to right is clearly shown The superiority is especially marked in the last, the loaf being both larger and finer in texture than the others

improvements in quality are accompanied by the presence of from 3 to 4 per cent more protein in the wheat from the treated than in the wheat from the untreated plots. The most striking improvement occurs, however, in the baking quality of the flour. (Fig. 279.)

E. T. WHERRY.

WHEAT-SCAB Control Effected by Cleaning up Refuse of Crops

Wheat scab can be controlled by cleaning up cornstalks and other crop refuse. The clean-up program developed for the control of the European corn borer will control wheat scab and materially reduce the amount of corn ear rots. These facts should be taken into consideration in advancing the clean-up program in the borer-infested area. Wheat-scab and ear-rot control also should be emphasized in the educational program for better clean-up methods on the farms of the Corn Belt in general. Plant pathologists have recommended removing or plowing under all cornstalks, straw, and stubble for the control of wheat scab and corn ear rots. The additional menace of the corn borer in the Corn Belt has made this sanitation program an absolute

necessity. The cutting, shredding, and plowing under of the cornstalks, weeds, etc., not only will reduce the damage done by the corn borer, but will reduce losses from corn ear rots and wheat scab.

The fungous parasites causing wheat scab and most of the corn ear rots live over winter on the dead cornstalks, wheat straw, stubble, and other crop refuse. These blight-producing and rot-producing organisms grow on the old straw and cornstalks during the fall and form resting spores which carry them through the winter. (Figs. 280 and 281.) In the late spring and summer of the following year

FIG. 280.—The black spore cases containing the resting spores of the wheat-scab parasite. The scabbed wheat heads, A, as well as old stubble and straw left on the ground, B, carry the parasite over winter to infect the next year's corn and wheat crops. Plow this material under in the fall or early spring to prevent wheat scab.

these spores ripen and are blown from the old stalks and straw to the wheat heads and corn ears to cause wheat scab (fig. 282) and corn ear rots, respectively.

Removing or plowing under this crop refuse, if done in the fall, prevents development of the winter spores, and if done in the spring prevents their movement by wind to wheat and corn plants.

Wheat-scab losses are much less where the stalks are plowed under. The data presented in Table 18 give evidence of the effectiveness of clean fields in controlling wheat scab in several different States of the Corn Belt in the season of 1919.

TABLE 18.—*Comparison showing advantage of plowing under stalks in reducing wheat scab, 1919*

State	Per cent scab where wheat was sown in cornstalks	Per cent scab where wheat was sown in plowed oat or wheat fields
Iowa	71	39
Illinois	[illegible]	33
Indiana	39	20
Ohio	33	8
Tennessee	21	4
Wisconsin	14	1
Average of all States	40	18

FIG. 281.—The black spore cases of the wheat scab parasite on corn stubble, A, and stalk, B. The cornstalks and stubble must be completely turned under by plowing to prevent wheat scab and corn ear rot due to this parasite

Wheat-scab Infection in 1919

The wheat-scab infection in 1919 was so heavy throughout Iowa, Illinois, and Indiana and cornstalks bearing resting spores were so numerous that the real effect of the clean-up and plowing was not so marked as it otherwise would have been. Even under these conditions, however, there was less than half as much scab present in the wheat on clean-plowed fields as occurred in fields where cornstalks

were present The results in Ohio and Tennessee were more nearly comparable to those of ordinary seasons The detailed experiments in Illinois in 1921, summarized below show even more concisely the effectiveness of the clean-up and plowing on wheat-scab control

Turkey wheat sown in corn -
Turkey wheat sown in plowed wheat or oat fields

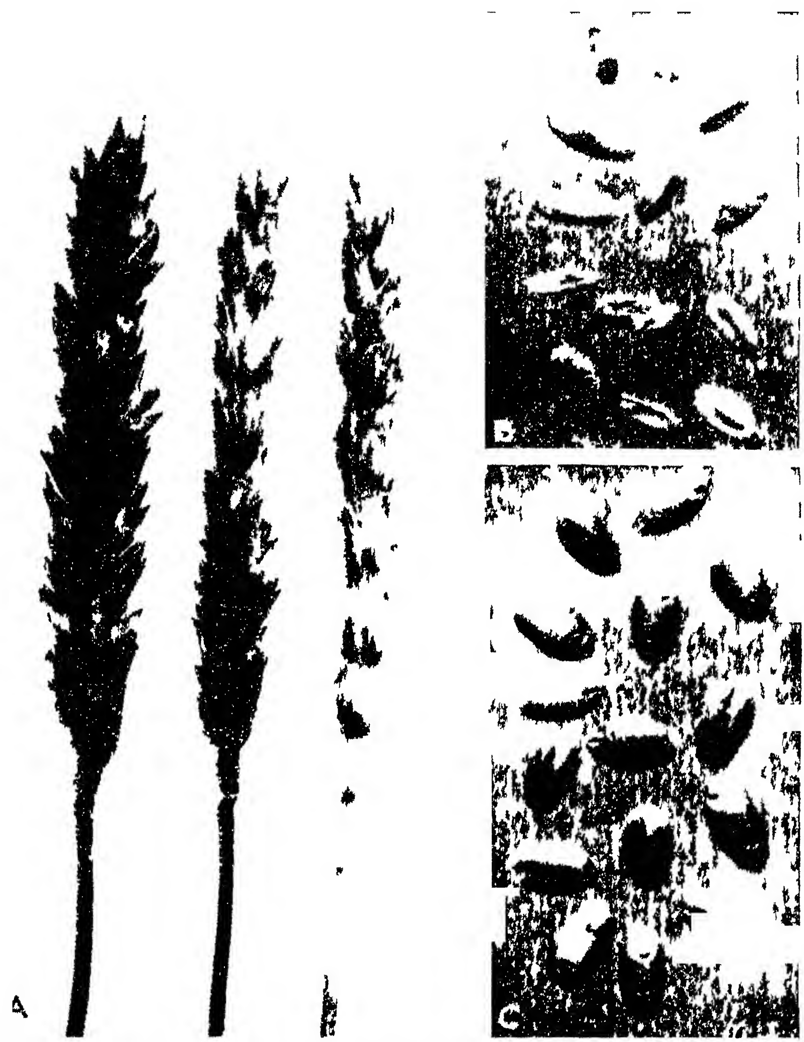

FIG. 28.—Effects of wheat scab in blighting the heads and shriveling the kernels as shown by comparison of healthy and diseased specimens The spores causing this disease come chiefly from old cornstalks and wheat straw left on the field

No figures are available to compare the quantity of scab in wheat on cornland with stalks left on the field and with stalks removed. The results undoubtedly would be similar to those reported above.

These summaries show that where wheat is sown in cornstalks carrying the winter spores of the wheat-scab parasite (fig. 283), there is two to four times more damage done by wheat scab than in fields that have been plowed and are relatively free from stalks carrying these spores.

The control of the corn ear rot produced by this wheat-scab parasite by rotation and clean-up measures is just as striking. In 1926 the same inbred line of corn was sown on two fields of similar topography and character, the only difference being in crop rotation and soil preparation. The first field was on clover sod well plowed; the second was on continuous corn with stalks poorly plowed under

FIG. 283.—Winter wheat sown on poorly prepared cornland. There was 31.6 per cent of wheat scab in this field at harvest, causing a loss of one-fourth of the crop

The following summary gives the results in ears damaged by the wheat scab parasite:

Previous crop and soil preparation:	Per cent ears damaged by wheat-scab parasite
Corn on well-plowed clover sod	0.0
Corn on cornland with old stalks poorly plowed under	15.9

Caused Increased Ear Rot

The increased ear rot was due to the presence of the wheat-scab parasite on the old cornstalks and to the lower rate of maturity on the less fertile, poorly prepared cornland. Proper crop rotation and soil preparation, including cleaning up the old cornstalks, insures an earlier crop, higher yields, and less loss from ear rots.

Wheat scab and corn ear rots are taking large annual tolls from the wheat and corn crops of the Central States. Much of this reduction in acre yield and lowering of quality can be eliminated by crop rotation, by clean-up of cornstalks, straw, and stubble, and by thorough plowing.

JAMES G. DICKSON.

WHEAT Stinking-Smut Control by Copper-Carbonate Method In the last few years the copper-carbonate dust treatment of seed wheat has practically supplanted the copper-sulphate and formaldehyde treatments for the control of stinking smut. It consists in thoroughly mixing in a tight container powdered copper carbonate and wheat at the rate of 2 to 3 ounces of the dust to each bushel of seed. The rapid spread and general use of the new treatment under a wide variety of conditions has quickly brought to light its advantages and disadvantages. The former so much outweigh the latter that, it seems safe to say, the treatment will maintain its popularity. Some of the distinct advantages of copper carbonate are noted below:

(1) It does not injure germination.

(2) Seed may be treated whenever convenient and stored without injury.

(3) Dusted seed may be planted at any time in dry or moist soil.

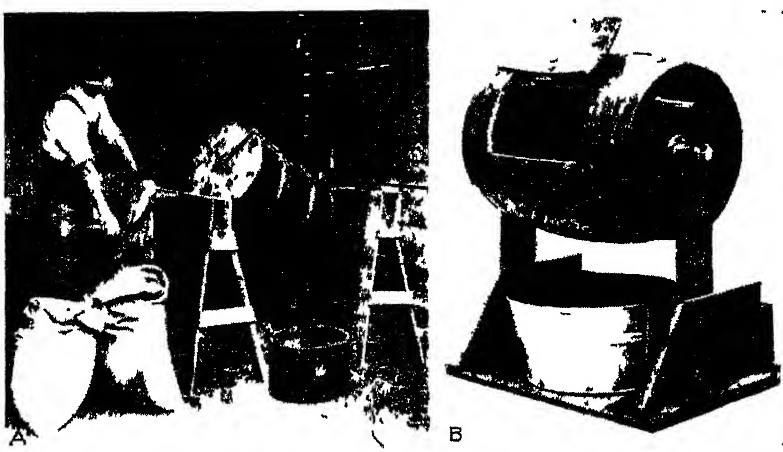

FIG 284 -Two simple homemade mixers for applying copper-carbonate dust to seed wheat A, barrel mixer, B, oil-drum mixer

(4) Copper carbonate protects stored grain from weevils. Rats and mice will not eat treated seed if there is untreated grain on which they can feed.

In recommending and in using copper carbonate it is well to keep in mind, however, that it is not a perfect treatment and that it is not superior to copper sulphate and formaldehyde in all respects. Following are the chief disadvantages of copper carbonate:

(1) When inhaled it may cause severe nausea. This may be avoided by wearing a respirator or wet handkerchief over the nose and mouth while the dust is flying. It is also advisable to do the treating outdoors or in a well-ventilated place.

(2) Under moist conditions, when copper-carbonate treated wheat is allowed to stand overnight or longer in a drill it may set or cake more or less and may cause twisting or breaking of shafts or gears in the feeding mechanism when next starting the drill. To prevent injury to drills sowing copper-carbonate treated wheat, the feeding mechanism should be loosened before starting the drill after it has stood for some time. This may be done by turning the feed shafts

with a wrench or by working the drill back and forth by hand. The gear bearings also should be oiled frequently, and it is well to flush out the feed cups from time to time with kerosene.

(3) A number of cases where copper carbonate failed to control stinking smut satisfactorily were reported in 1927. Recent experimental data show that the fungicidal efficiency of copper carbonate seems to be reduced when very heavy rainfall follows seeding. The unusually wet sowing seasons in the fall of 1926 and the spring of 1927 were probably responsible for the poor results noted.

(4) Surplus treated grain can not be used for other purposes. Tests have shown that copper-carbonate treated wheat is unfit for bread making, and it is not advisable to feed such wheat to livestock.

The advantages of the copper-carbonate treatment greatly overbalance its shortcomings. The treatment is winning its way where tried, and it is estimated by the Department of Agriculture that one-tenth of the total 57,000,000 acres of wheat grown in the United States in 1926 was sown with copper-carbonate treated seed. The new treatment is doubtless the most generally satisfactory method yet devised for the control of stinking smut in wheat.

V. F. TAPKE.

WOMEN'S Short Course at State Colleges Is Aid to Better Living

Neighborliness, friendliness, and mutual respect and understanding among farming people are essential to the advancement in rural life. Farm women's organizations have done much to develop these qualities and to help the farm family both to find more satisfaction in rural life and to learn how to make the most advantageous use of their time, energy, and funds. The short courses for farm women held at a number of the State agricultural colleges each year are outstanding examples of what has been accomplished by organized farm women in cooperation with the colleges toward home and community improvement.

These short courses have been developed in some States rather recently, the State colleges putting them on their calendar where the farm women's extension organizations have shown interest in having such a course. Usually the women who go to the college for the course assume responsibility of bringing back to their neighbors the substance of what is presented there. Regular meetings are held after their return at which those women who may want these new ideas but were not able to go to the short course may receive something of the information and inspiration given by the short course from the representatives of their communities who did attend.

The thought of this responsibility to her community has helped many a hesitating mother to decide that she can break away from her own busy schedule in order that her neighbor, as well as herself, may have the help to better home making. "Here," she has thought, "is something I ought to do for the good of my family and community, even if my family must be temporarily inconvenienced by it"

Source of New Outlook

And when she gets installed in the cool dormitory, walks on the beautiful campus, eats food she did not cook, sleeps knowing she

does not have to get up and get breakfast, meets women whose topics of conversation she does not know, studies and plays as she is told, lets the managing side of her brain rest while the learning section absorbs and grows for about a week, she goes back to her family with a new vision and outlook and enthusiasm and courage to realize her ideals of home and true neighborliness. (Fig. 285.)

Which institution we should honor as the first to offer this splendid opportunity for going back to one's school days is not certain. Perhaps it is a child of that sturdy parent of a number of honored members of the educational family tree, the farmers institute. At any rate, we do have in a number of States, county or community short courses which are very like the farmers' institutes except that they are only for women. The interest in Wisconsin's county seat short courses and the four-day home-makers' institutes which are

Fig. 285. Recreation and exercise are important phases of rural women's short courses

held in different parts of Oregon shows that this method meets a real need.

Farmers' week at the State agricultural college has come to be also home-makers' week in a number of States. The colleges of Massachusetts, New Hampshire, Delaware, Florida, Oklahoma, Washington, Utah, Connecticut, and others have found this plan well adapted to their needs.

West Virginia women have been combining the short-course idea with the enjoyment of the beautiful camp site at Jackson's Mill. Maryland has for six years held the rural women's short course at the university, where 518 women were enrolled this summer. (Fig. 286.) Alabama, North Carolina, Georgia, and Tennessee women are enrolling in increasing numbers for annual short courses given at either the State agricultural college or the woman's college.

Although degrees have not yet been conferred for such work, the University of Maryland awarded certificates to 51 Maryland women who completed at this year's short course four consecutive years of attendance. It was so much like college commencement that everybody called the "girls" the class of 1927

FIG 286 —Tree planting exercises at a rural women's short course, University of Maryland

Subjects Covered in Four Courses

In the Maryland short course groups of demonstrations and lectures are arranged in such a way that one can progressively cover the subjects in four courses, one each year, a feature apparently unique in such short courses so far. To the ever-present problems of clothing, foods, and household management have been added other subjects which are also problems, though not always appreciated as such—namely, beauty for the home, indoors and out, health, music, recreation, the companionship of books, parliamentary law, and citizenship.

Some of those receiving certificates had specialized in the same subject—clothing, household management, home beautification, or foods, perhaps—at each short course, whereas others had varied their lines of study each year. Many who are to preside in executive positions of their home-makers' clubs worked conscientiously in the parliamentary law classes. All enjoyed the hours in music appreciation, citizenship, and in the gymnasium.

The farm woman gets from her short course a joyous, stimulating experience which puts her on tiptoe for the next event in her life's business of making the home the best loved and most useful institution, that gives to the world hope and ideals and ability to strive for them, high standards of conduct, and a love that radiates beyond the four walls of a house and creates true neighborliness.

FLORENCE E. WARD.

WOOD Preservatives Add to Durability of Farm Structures Wooden structures on the farm can be made durable by keeping the wood relatively dry or, when that is not possible, by the use of suitable chemical wood preservatives. Ordinary wettings of short duration are not apt to cause decay, but wood which remains damp for considerable periods may rot out in two or three years. This is true of the sapwood of any species and even the heartwood of species not markedly resistant to decay. The heartwood of some species, including the cedars, redwood, cypress, juniper, chestnut, osage orange, catalpa, and black locust, is very resistant to decay and usually has a long life even in damp situations.

Fence posts, poles, gates, stable floors, hog houses, foundation timbers, mudsills, wooden walks, and chicken houses are some of the constructions that are difficult to keep from more or less continuous dampness in some part. In such cases, and in fact in any case where wood is in contact with the ground, the use of a chemical preservative is advisable, unless the material is heartwood of known durability.

Coal-tar creosote is the best preservative known for the purpose. It may enable treated wood in difficult conditions of service to last 5 or 10 times as long as untreated wood. Best results are obtained by treating the wood in closed pressure cylinders, but very satisfactory results may be obtained by heating the wood in the creosote oil in an open tank and then allowing the wood and oil to cool together. Applying creosote with a brush or by dipping does not give deep enough penetration to be recommended. Farmers' Bulletin No. 744–F contains detailed instructions for using coal-tar creosote.

Paint Preservative Sometimes Necessary

Creosoted wood discolors paint; hence, where it is necessary to paint, a water-soluble preservative such as zinc chloride, sodium fluoride, or a good patented preservative may be used. Instructions for the use of such preservatives may be obtained from the United States Forest Products Laboratory, Madison, Wis.

In houses, barns, and other roofed structures in which the wood does not rest directly on the ground, most of the wood can be kept dry enough to prevent decay without the expense of preservative treatment. Roofs must be kept in good repair. Sills and floor joists must be supported a foot or more off the ground on foundations of stone, concrete, or treated wood. Dirt or manure piles must be kept away from the sides of the building, and any other condition that tends to keep the wood damp must be avoided. A wooden building properly designed and constructed and maintained in good repair should last almost indefinitely.

George M. Hunt.

WOOD that is Dry Holds Nails Better than Green Wood The nail-holding power of wood is greater if the wood is dry when the nail is driven than if it is green or wet, and the difference only becomes more pronounced as the wet-nailed material dries. The greater ease with which nails can be driven into green wood and the freedom from

splitting gained might compensate for an initial difference in holding power were it not for the more serious after effects. A nail in penetrating a piece of wood forces aside, bends, crushes, breaks, and otherwise distorts the fibers, which in turn react to resist withdrawal of the nail, thus producing what is termed nail-holding power. If, however, shrinkage follows this fiber distortion, as when green wood dries, the holding power is very soon practically destroyed, as the fibers in contact with the nail are the first to dry out.

FIG. 287.—Fiber distortion—nail in place

FIG. 288.—Fiber distortion—nail removed

The accompanying illustrations are enlarged views showing some of the fiber displacement that occurs when a nail is driven into western yellow pine. Figure 287 shows distinctly how the distorted fibers apply end-grain pressure to the nail. Figure 288 shows the nail channel after the nail has been removed and reveals the condition of the fibers that were merely forced aside so that they applied side contact. If the fibers are dry

and rigid, as in seasoned wood, the resistance to immediate withdrawal is relatively high; if they are soft and flexible, as in green or wet wood, the resistance is correspondingly lower. For this particular species the difference is approximately 25 per cent.

The end-grain pressure of the fibers is much greater than the side-contact pressure and is the chief factor in resisting withdrawal of a nail immediately after driving. In drying the turned-down end-grain fibers shrink and lose contact with the nail, and by far the greatest element of holding power is lost. This is the principal reason why changes in the moisture content of wood after nails are driven are so serious. In western yellow pine the loss of holding power upon drying is more than 80 per cent for material nailed green. There is also a loss of holding power when material originally nailed dry is soaked and redried after the nail is pulled. The loss, however, is not so great as in the other case, being about 60 per cent for western yellow pine.

G. M. GAHAGAN.

WOOD Well Seasoned Gives Best Results in Farm Construction Wood has a normal tendency to shrink as it dries. If the shrinkage is not allowed to take place before the wood is put to use, the finished structure will almost surely develop defects such as cracks and checks, warping and twisting, and nail loosening. Checking and splitting may cause structural weaknesses in buildings. Shrinkage and distortion may spoil the fit of doors and windows.

The Forest Products Laboratory recently made up two hog houses from lumber sawed from the same log, one from a portion of the lumber that was unseasoned, the other from a portion that was thoroughly seasoned. The difference between these two houses after the green lumber had dried out is shown in Figure 289. (See p. 714.) In the hog house at A (made from unseasoned wood) note the opening up of the joints between boards on the exterior and in the floor and the cupping of roof boards. Defects which are less obvious are the splitting of battens at the nails, the sinking and pulling together of nails holding the battens, and the splitting of roof battens and boards.

For most uses outdoors in farm buildings and equipment lumber can be seasoned sufficiently by a few months storage in piles. For use in the interior of buildings lumber is usually kiln-dried by the manufacturer.

ROLF THELEN.

WOOL-SCOURING Tests Aid in Ascertaining Value of Grease Wool The quantity of pure wool fiber in the fleece as it is sheared from the sheep may be from 20 to 75 per cent of the total weight of the fleece. Before wool can be made into yarns or used in the manufacture of goods, therefore, the grease and other foreign matter must be removed. As the producer has no practicable method by which he can remove these impurities, and as each fleece usually contains more than one grade of wool together with one or more offsorts, it would

not be feasible for the grower to do his own scouring. He must dispose of the clip in its grease condition.

The price offered for an individual lot of wool is usually adjusted according to the estimated loss in shrinkage when the impurities are

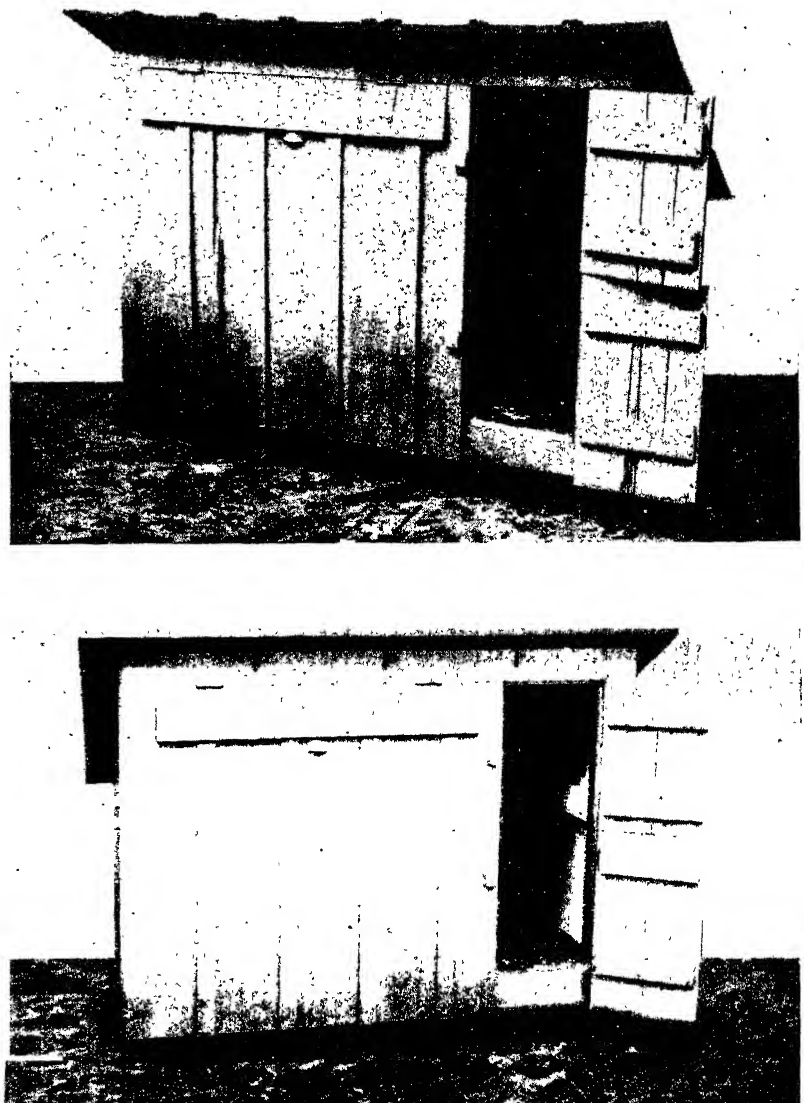

FIG. 289.—Hog houses made of, A, unseasoned wood, and, B, well-seasoned wood

removed. Wools of fine fiber, long staple, and light shrink are of more value in the grease than are wools of fine fiber, short staple, and heavy shrink. There is a certain relation between the fineness of fiber and the loss in scouring. In determining a price on the grease

basis these factors and others must be taken into consideration. The true value of any number of fleeces is based upon the quantity of clean wool they will produce when grease and impurities have been removed.

The buyer has the choice of two courses in arriving at the price per grease pound. The estimated shrinkage or actual scouring tests may be made on representative samples of the lot, or the buyer may merely estimate the shrinkage. The grower is often at a great disadvantage when an estimate governs the price offered. Without knowing whether the offer represents the true value, he must accept or refuse. The practice of buying and selling on a stipulated price for an entire clip is detrimental to wool improvement for the grower has no way of learning the grades or the value of the wool produced.

Practice in Estimating

Estimating the yield of a lot of wool is a question of practice. The expert bases his judgment on previous results obtained with wool of the same kind and origin; the accuracy of his estimate depends upon his experience and memory. Experiments have shown that great variations exist between the yield of a lot of wool as estimated by experts and as produced by scouring.

The importance of shrinkage to the wool grower can not be overestimated. With a reliable report as to the grade and shrinkage of the wool produced the approximate grease value can be obtained.

The following example is given for figuring grease price per pound:

Fine French combing is quoted at $1.05 per pound on scoured basis in Boston. This lot of wool, if found to shrink 68 per cent, leaves 32 per cent of clean wool. Then 32 per cent of $1.05 is $0.336, the grease value. As this is the value of the wool delivered in Boston, from it must be subtracted the charges for freight, insurance, storage, cartage, etc. This amount varies somewhat in accordance with the distance from the market and averages approximately 5 cents per pound.

This method can be applied in figuring the grease price of any grade of wool providing both the scoured price and the shrinkage are known. If the producer has the grade and shrinkage of his wool or wools and knows the market price per scoured pound, he can figure the approximate price he should receive for his wool in the grease state.

The care and management of a flock may have a pronounced effect on the shrinkage; seasonal variations may have the same effect. Results of a shrinkage test made on a clip during one season can not be satisfactorily applied to clips of subsequent years.

With a view to establishing a standard method by which samples may be drawn and scouring tests made, the Bureau of Agricultural Economics is now conducting scouring investigations.

When a sample of wool is received, its weight under natural atmospheric conditions is recorded. (Fig. 290.) It is then placed in a conditioning room under a standard temperature of 70° F. with a relative humidity of 65°. After remaining for 48 hours the sample is again weighed and the weight recorded. The wool is then classified according to the official wool standards of the United States, is scoured in a semicommercial scouring machine, is thoroughly dried,

FIG. 290.—Sorting and grading samples of fleeces preparatory to scouring

reconditioned, and weighed. (Fig. 291.) The difference between the weight of the conditioned grease wool and the weight of conditioned scoured wool represents the total loss or shrinkage. The solutions used in scouring are compounded by weight and maintained at a standard temperature during the process. Reports of the tests are rendered showing the grades of wool and the loss from shrinkage in the sample submitted.

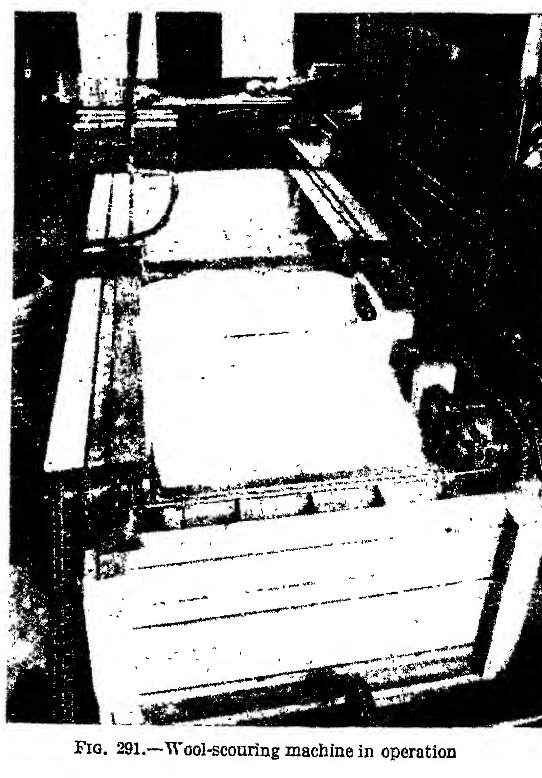

FIG. 291.—Wool-scouring machine in operation

The results obtained from scouring a large number of samples of the same grade from the same locality should approach a comparatively accurate figure. This figure should be a more accurate basis

for estimating shrinkage than is now available. The results should be of material aid in determining the grease value. They will at least furnish the minimum and maximum. This information alone is valuable to the grower.

Importance of Cleansing

Cleansing is the most important process to which wool is subjected, inasmuch as the success of all subsequent processes depends on its efficient performance. The calculations of the wool buyer, the skill of the wool blender, the spinning property of the material, the uniformity of the dyeing and finishing treatment may be disturbed if the cleaning operation fails to receive proper consideration. For example, if a certain lot of wool shrinks 50 per cent, 1 pound of clean wool is worth more than 2 pounds of greasy wool, since the value of 1 pound of clean wool equals the value of 2 pounds of the greasy plus the cost of scouring.

The scouring of wool can not improve its naturally good properties for spinning and fabric purposes, but it may impair them by means of the agents used for scouring purposes. The effects of scouring are both chemical and physical; therefore it behooves the operator to use great care to avoid the defects which can be caused as the wool passes through the scouring bowls. A scouring solution that is maintained at too high a temperature or one that is too strong an alkali is injurious, and the combination is likely to result in discoloration and impairment of the structure of the fiber. Too much agitation in the bowls is liable to cause the fibers to become matted or felted.

George T. Willingmyre and
Lloyd A. Wood.

WOOL Standardization Progressing in U. S.; Gaining Favor Abroad Wool standards continue to prove their worth from a national standpoint. As they are used in practically every important agricultural college, the basis for teaching wool standardization is uniform. Improvement in the quality and the preparation of wool is noticeable in many sections and programs are under way for still further improvement in many States. Growers are more thoroughly informed now than ever before as to grades of wool, and the other associated factors, which are considered in establishing value. Consequently an improved method of marketing is developing.

These standards have been found to be applicable for world use. The international need is perhaps more pronounced because of the great span between production and manufacturing fields. Competition in world markets is usually keen but to be equitable the competition should be fair and on an equal and uniform basis for comparison.

One of the most recent indorsements of the official wool standards came in the form of a resolution passed at the Pan American conference held in Washington. Not only were resolutions passed indorsing the standards but recommendations to the South American countries were made that each country adopt and use wool standards.

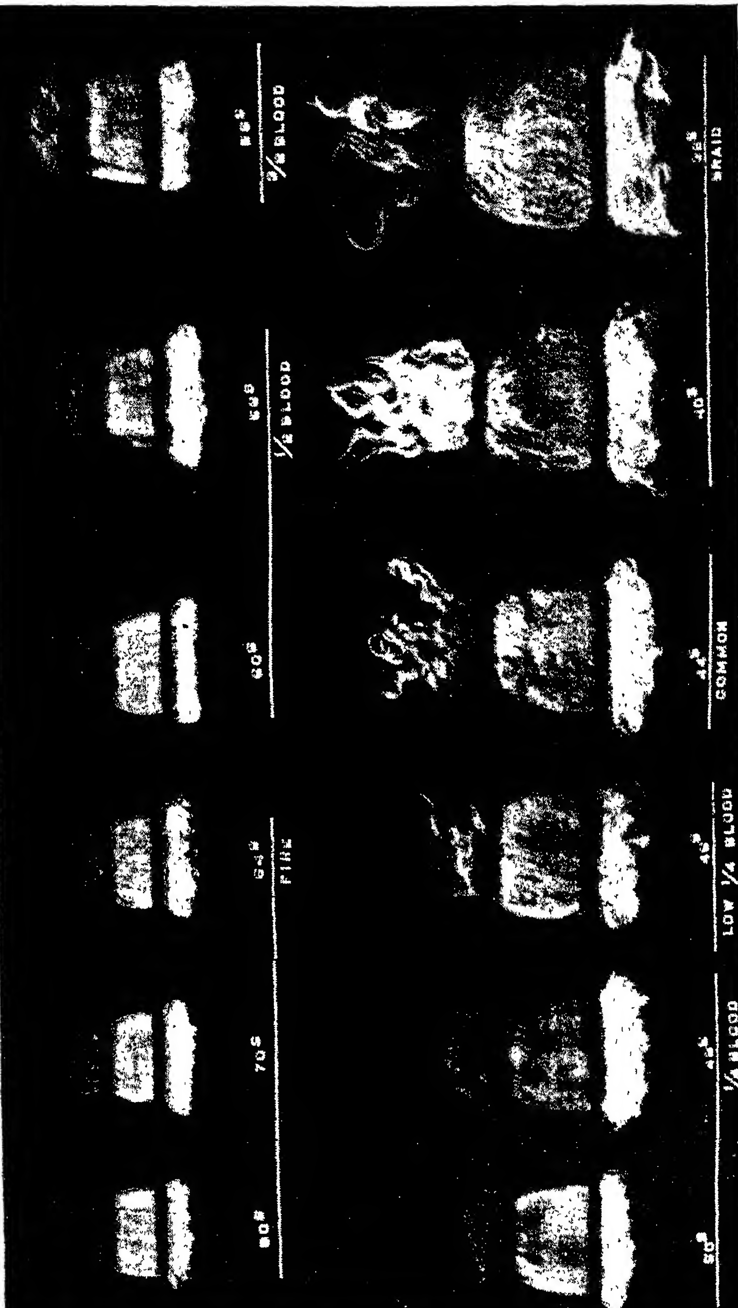

FIG. 292.—Practical form of the wool standards ranging from the finest, upper left, to the coarsest, lower right

As a result of this action many sets of standards have been supplied to the trade and Governments of South American countries. Eight sets were requested by and recently sent to the Valparaiso Chamber of Commerce for the use of its members dealing in wool.

Standardization of wool grades has received serious consideration in England. The Empire marketing board has about completed financial arrangements for a grant of $45,000 for the development of standards of all wool factors affecting value and spinning property. The developments have in every phase of wool standardization been constructive.

The standards are furnishing the base for compiling national and international statistics of stocks and consumption. By these statistics based on comparable qualities trends can be gauged intelligently.

Practical forms of the official wool standards have been forwarded to all the important wool consuming and producing countries of the world. This distribution provides a practical way of conveying this country's view on this subject.

The method of showing wool standards is by the issuance of standards in practical forms. An underlying principle of standardization is the elimination of the personal element of judgment and error. Standards in practical form are of inestimable value in commerce and are a guide to intelligent production. Wool has many value factors, some of them varying greatly. The most important of these factors, diameter of fiber, is best shown by the practical standards. The great variation relative to length of staple, origin, and characteristics, on which there are diverse opinions, remain for further study.

GEORGE T. WILLINGMYRE.

WORKERS at Casual Farm Jobs Vital to the Supply of Labor Casual laborers are hired on American farms for many rush-time jobs. These jobs are largely harvesting operations. These laborers work at hundreds of different tasks for which the usual ordinary farm force is not sufficient, and constitute a vital part of the agricultural labor supply. Important as they are to farmers, comparatively little is known concerning them. On the job this week, gone next week, they are of little interest to the average farmer except that they can rush his work while in his employ.

In a recent survey, the Department of Agriculture has collected data concerning the wages and perquisites given to casual farm hands on more than 200 different kinds of jobs scattered over the country, involving the employment of many thousands of laborers. The list is far from complete, but includes those most commonly demanding rush labor.

The duration of farm jobs for casual laborers ranges from one or two days to the greater part of the crop season. Those studied averaged four weeks or less. In much the larger part of the cases the single job lasts longer than half the length of time such employment is available in the vicinity. This fact forces upon the laborer frequent unemployment, and loss of time and money in hunting in new localities for new jobs.

Most of the jobs reported give five to six days' work a week, and a few give more. Weather and crop conditions in some cases shorten the weekly working time average to four days.

Wages for casual farm work are commonly such as to attract to the jobs persons who are ordinarily not engaged in it. Sometimes, as in wheat harvest, this means obtaining hundreds of men from a distance and in direct competition with the labor demands of industry. In other cases, as in some truck-crop and small-fruit work, children or young people and women, who ordinarily do little other paid work, are gathered for picking berries and vegetables. The fact that this latter employment is within the strength and ability of a large class of unskilled workers, serves to keep down some wage rates while it makes available large sources of labor supply.

Variety of Ways of Payment

Casual workers are paid in a variety of ways. Truck-farm hands are commonly paid for time work (by the hour, day, or week) and on piecework rates. Fruit pickers are similarly paid. Piecework rates were reported as predominating in such jobs as small-fruit picking. Orchard fruits are usually picked on time rates if careful handling of products is necessary, or on piecework basis when care is not so essential and work must be finished quickly. Cotton is picked by the pound. Corn is husked by the shock or pile. These units of measurement vary locally. Sugar-beet work is done by the acre, usually under written contract. Livestock work, such as sheep shearing, is often paid for by the head.

The survey showed the average cash earnings of casual workers to be about $3 per day. They vary from $1 to $11. Half the jobs did not give opportunity to earn $18 a week, or to make over $70 on a single farm. This takes no account of time and money lost between jobs.

The cash wages of casual workers were reported as supplemented, in a large number of the cases, by perquisites. These vary somewhat in kind and value from one region to another. Many farmers consider these allowances or privileges so trifling that they place no value on them. That they total a considerable amount, even at farm values, is shown by the fact that those farmers who did value them in reporting gave averages of about $1.25 per day.

On many jobs, however, no perquisites are allowed. Apparently not over three out of four casual hands get anything beside money wages for their work. As a whole, perquisite values amount to less than a third of total cash earnings. Average total earnings including perquisites, amount to a little over $4 daily.

Board the Commonest Perquisite

Board is the perquisite most commonly reported. Three out of four jobs provide one or more meals per day. The averages are 91 cents in value for 2.8 meals daily.

Lodging quarters are provided on more than half of the jobs and these lodgings usually have furniture. The furnished lodgings are valued at an average of nearly 50 cents a day, and the unfurnished ones at three-quarters as much.

Fuel and light are added in a large number of the cases in which lodgings are provided. These together have an average value of about 20 cents a day.

The laundry work for the casual laborers is worth 12 cents daily.

In some cases where board is not given, the workers are provided with foodstuffs (largely farm products) to use in cooking for themselves. These have an average value of a 25 cents daily.

Providing transportation for workers between their homes and working places is a frequent necessity for many farmers. In many cases this must be done both morning and night. The daily value of such service averages another 25 cents.

J. C. Folsom.

WORKERS on Farms Fewer Since 1923 But Output Not Less Farm production in the United States during the past three years has been maintained and, in some instances, increased in the face of a gradually declining number of persons actually engaged in productive farm enterprises. The decline in the number of persons working on farms is indicated by Figure 293 which is based upon the number of persons

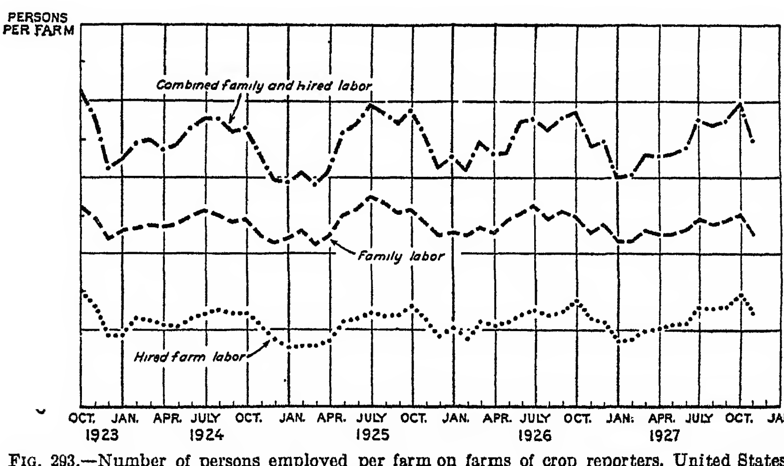

Fig. 293.—Number of persons employed per farm on farms of crop reporters, United States, October, 1923, to November, 1927

working on the first day of each month on the farms of crop reporters. Since October 1, 1923, crop reporters have been asked to report on the 1st day of each month the number of "persons working on the farm—(1) family labor, including operator, (2) hired help, including monthly, day, and piecework hands." In the graph these reports are shown in terms of the number reported per farm.

A number of typical changes in the number of persons employed on farms is brought out. For example, family labor tends to increase in June with the close of the school term and tends to decrease again in September on the opening of schools. The number of persons during December, January, and February decreases considerably over preceding months probably because of the movement of farm employees at that time of the year into winter industries,

such as the storage of ice, lumbering, etc. The number of hired laborers tends to increase with the harvest as a result of the employment of migratory and transient labor at that time of the year.

Man power on the farm seems to have been considerably less in 1925 than in 1924, with a slight recovery in 1926, followed by lower figures for 1927. The contraction in 1925 appears to have occurred largely in hired farm labor. Since that date, hired labor shows little change, but family labor has continued on a downward trend.

Seasonal fluctuation in the number of family laborers is not large. The principal cause of variation appears to be the ebb and flow of members of the farm family to and from school. Seasonal fluctuation in hired labor is not as large as commonly supposed. It would appear that the farmers who constitute the crop-reporting group have progressed materially in the direction of steady employment of labor and have eliminated many of the peaks and troughs of extensive systems of farm operations.

JOSEPH A. BECKER.

Miscellaneous Lists

List of new Farmers' Bulletins, Department Bulletins, Department Circulars, Miscellaneous Circulars, Statistical Bulletins, Technical Bulletins, Circulars, Leaflets, and Miscellaneous Publications issued from January 1, 1927, to December 31, 1927, classified by general subject matter

[These different types of publications are indicated by the letters preceding each serial number]

Birds and Game:		
Propagation of Game Birds	F. B.	1521
Game Laws for the Season 1927–28	F. B.	1550
The Magpie in relation to Agriculture	T. B.	24
Our Migrant Shorebirds in Southern South America	T. B.	26
Directory of Officials and Organizations Concerned with the Protection of Birds and Game, 1927	M. P.	6
Cotton:		
Development of Flowers and Bolls of Pima and Acala Cotton in Relation to Branching	D. B.	1365
Cotton Prices and Markets	D. B.	1444
Community Production of Acala Cotton in the Coachella Valley of California	D. B.	1467
Cotton-Spacing Experiments at Greenville, Tex	D. B.	1473
Factors Influencing the Severity of the Crazy-Top Disorder of Cotton	D. B.	1484
Manufacturing Tests of Cotton of the White Grades of the Universal Standards for American Cotton	D. B.	1488
Growth and Development of Cotton Plants at Greenville, Tex	D. C.	401
Sea-Island and Meade Cotton in the Southeastern States	D. C.	414
Lygus elisus: A Pest of the Cotton Regions in Arizona and California	T. B.	4
Practices and Costs of Cotton-Gin Operation in North-Central Texas, 1924–25	T. B.	13
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Boys' and Girls' 4-H Club Work under the Smith-Lever Act, 1914–1924	M. C.	85
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A Ten-Year Review of Home-Management Extension, 1914–1924	Cir.	17
A Review of Five Years of Fact Organization and State and Regional Program Making in the Western States and a Report of the 1927 Extension Conference	M. P.	8
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The Production of Hybrid Palestine Iris Corms	T. B.	11
Forage Crops:		
Bean Growing in Northern Idaho, Eastern Washington, and Eastern Oregon	F. B.	1509
Forage Crops and Their Culture in Northern Nebraska and the Dakotas	F. B.	1511
Soy Beans: Culture and Varieties	F. B.	1520
Effective Haying Equipment and Practices. For Northern Great Plains and Intermountain Regions	F. B.	1525
The Life History of Timothy	D. B.	1450
Forestry and Trees:		
Clearing Land of Brush and Stumps	F. B.	1526
Shortleaf Pine Primer	F. B.	1534
The Suitability of American Woods for Paper Pulp	D. B.	1485
Defects in Timber Caused by Insects	D. B.	1490
Timber Growing and Logging Practice in the Central Hardwood Region	D. B.	1491
Timber Growing and Logging Practice in the Douglas Fir Region	D. B.	1493
Timber Growing and Logging Practice in the Western White Pine and Larch-Fir Forests in the Northern Rocky Mountains	D. B.	1494
The Relation of Insects to Slash Disposal	D. C.	411
The Control of Stain, Decay, and Other Seasoning Defects in Red Gum	D. C.	421
A Forest Fire Prevention Handbook for School Children	M. C.	79
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A Forest Fire Prevention Handbook for the Schools of Arizona	M. C.	88
A Forest Fire Prevention Handbook for the Schools of New Mexico	M. C.	89
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Check List of the Forest Trees of the United States: Their Names and Ranges	M. C.	92
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The Forest, a Handbook for Teachers	M. C.	98
The Natural Replacement of Blight-Killed Chestnut	M. C.	100
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MISCELLANEOUS:
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- Spray Irrigation in the Eastern States — F. B. 1529
- Rat Control — F. B. 1533
- Drainage by Means of Pumping from Wells in Salt River Valley, Arizona — D. B. 1456
- Production and Utilization of Fats, Fatty Oils, and Waxes in the United States — D. B. 1475
- Highway Bridge Location — D. B. 1486
- The Farm Real Estate Situation, 1926 — D. C. 377
- The Domestic Oil Burner — D. C. 405
- Rules for Seed Testing — D. C. 406
- Work of the Belle Fourche Field Station in 1923, 1924, and 1925 — D. C. 417
- The Use of Electrolytic Bridge for Determining Soluble Salts — D. C. 423
- The Relations Between Crop Yields and Precipitation in the Great Plains Area — M. C. 81
- Workers in Subjects Pertaining to Agriculture in State Agricultural Colleges and Experiment Stations, 1926–27 — M. C. 87
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- Irrigated Crop Rotations in Western Nebraska — T. B. 2
- Work of the United States Dry-Land Field Station, Ardmore, S. Dak., 1912 to 1925 — T. B. 17
- Studies of the Occurrence and Elimination of Kemp Fibers in Mohair Fleeces — T. B. 35
- Settlers' Progress in Dry-Land Farming in Eastern New Mexico — Cir. 4
- Work of the Scotts Bluff Field Station, 1922 to 1925 — Cir. 5
- An Apparatus for the Rapid Vaporization of Carbon Disulphide — Cir. 7
- The Farm Real Estate Situation, 1926–27 — Cir. 15
- Editorial Policy Regarding Journal of Agricultural Research — M. P. 3
- List of Technical Workers in the Department of Agriculture, and Outline of Functions of Major Branches of the Department, 1927 — M. P. 5

PLANT DISEASES:
- Diseases of Cabbage and Related Plants — F. B. 1439
- Peach Brown Rot and Scab — F. B. 1527
- Smuts of Wheats and Rye and Their Control — F. B. 1540
- The Common Barberry and Black Stem Rust — F. B. 1544
- Citrus Melanose and Its Control — D. B. 1474
- Experiments on the Control of the Plum Curculio, Brown Rot, and Scab, Attacking the Peach in Georgia — D. B. 1482
- Dusting with Monohydrated Copper Sulphate and Lime for Control of Pecan Scab — D. C. 412
- Further Studies on Flag Smut of Wheat — D. C. 424
- Observations on Some Alfalfa Root Troubles — D. C. 425
- Copper-Carbonate Seed Treatment for Stinking Smut of Wheat — M. C. 108
- The Productiveness of Corn as Influenced by the Mosaic Disease — T. B. 10

PLANT INSECTS:
- The Control of the Alfalfa Weevil — F. B. 1528
- The Tobacco Budworm and Its Control in the Georgia and Florida Tobacco-Growing Region — F. B. 1531
- The Parasites of Popillia japonica in Japan and Chosen (Korea) and Their Introduction into the United States — D. B. 1429
- The Satin Moth, a Recently Introduced Pest — D. B. 1469
- Chemotropic Tests with the Screw-Worm Fly — D. B. 1472
- A Progress Report on the Investigations of the European Corn Borer — D. B. 1476
- A Study in Hyperparasitism, with Particular Reference to the Parasites of Apanteles melanoscelus (Ratzeburg) — D. B. 1487
- Pertinent Information Regarding the 1927 Spring Clean-up of Areas Quarantined on Account of the European Corn Borer — M. C. 102
- Spread and Infestation by the European Corn Borer During 1926 — M. C. 104
- The Citrus Insects of Japan — T. B. 15
- Parasites of the Pink Bollworm in Hawaii — T. B. 19
- The Larger Sod Webworm — T. B. 31
- Scouting, Quarantine, and Control for the European Corn Borer — T. B. 53
- Status of Imported Parasites of the European Corn Borer — Cir. 14
- Cutworms in the Garden — Leaf. 2

POULTRY AND EGGS:
- Farm Poultry Raising — F. B. 1524
- Feeding Chickens — F. B. 1541

SOILS AND FERTILIZERS:
- The Trend Toward a More Effective Use of the Land as Shown by the Yield per Acre of Certain Crops — D. B. 1458
- Grouping of Soils on the Basis of Mechanical Analysis — D. C. 419

TRUCK CROPS:
- A Method of Growing Bacteriologically Sterile Potato Plants — D. B. 1465
- Effect of Planting Distances and Time of Shelling Seed on Peanut Yields — D. B. 1478
- Some Effects of Freezing on Onions — D. C. 415
- Yield Tests of Disease-Resistant Sugar Canes in Louisiana — D. C. 418
- Emergency Methods for Reconstitution of Flooded Sugar-Cane Districts in Louisiana — M. C. 107
- Origin and Distribution of the Commercial Potato Crop — T. B. 7
- Fertilizer Tests with Flue-Cured Tobacco — T. B. 12
- Freezing Injury to Potatoes — T. B. 27
- The Jerusalem Artichoke as a Crop Plant — T. B. 33

List of Land-Grant Colleges in the United States

This list includes all colleges of agriculture and mechanic arts receiving the benefits of the acts of Congress of July 2, 1862, and August 30, 1890. Those marked with an asterisk (*) do not maintain courses of instruction in agriculture.

State or Territory	Name of institution and location	President [1]
ALABAMA	Alabama Polytechnic Institute, Auburn	Spright Dowell.
	Agricultural and Mechanical Institute for Negroes, Normal	J. F. Drake.
ALASKA	Alaska Agricultural College and School of Mines, College	C. E. Bunnell.
ARIZONA	College of Agriculture of University of Arizona, Tucson	J. J. Thornber [2].
ARKANSAS	College of Agriculture of University of Arkansas, Fayetteville	D. T. Gray.[2]
	State Agricultural, Mechanical and Normal School, Pine Bluff	R. E. Malone.[3]
CALIFORNIA	College of Agriculture of University of California, Berkeley	E. D. Merrill.[2]
COLORADO	State Agricultural College of Colorado, Fort Collins	C. A. Lory.
CONNECTICUT	Connecticut Agricultural College, Storrs	C. L. Beach.
DELAWARE	School of Agriculture, University of Delaware, Newark	C. A. McCue.[2]
	State College for Colored Students, Dover	R. S. Grossley.
FLORIDA	College of Agriculture of University of Florida, Gainesville	Wilmon Newell.[2]
	Florida Agricultural and Mechanical College for Negroes, Tallahassee.	J. R. E. Lee.
GEORGIA	Georgia State College of Agriculture, Athens	A. M. Soule.
	Georgia State Industrial College, Savannah	B. F. Hubert.
HAWAII	University of Hawaii, Honolulu	D. L. Crawford.
IDAHO	College of Agriculture of University of Idaho, Moscow	E. J. Iddings.[2]
ILLINOIS	College of Agriculture of University of Illinois, Urbana	H. W. Mumford.[2]
INDIANA	School of Agriculture of Purdue University, La Fayette	J. H. Skinner.[2]
IOWA	Iowa State College of Agriculture and Mechanic Arts, Ames	R. M. Hughes.
KANSAS	Kansas State Agricultural College, Manhattan	F. D. Farrell.
KENTUCKY	College of Agriculture of University of Kentucky, Lexington	T. P. Cooper.[2]
	Kentucky State Industrial College, Frankfort	G. P. Russell.
LOUISIANA	Louisiana State University and Agricultural and Mechanical College, Baton Rouge.	T. W. Atkinson.[4]
	Southern University and Agricultural and Mechanical College, Scotlandville.	J. S. Clark.
MAINE	College of Agriculture of University of Maine, Orono	L. S. Merrill.[2]
MARYLAND	College of Agriculture of University of Maryland, College Park	H. J. Patterson.[2]
	Princess Anne Academy, Princess Anne	T. H. Kiah.[5]
MASSACHUSETTS	Massachusetts Agricultural College, Amherst	R. W. Thatcher.
	*Massachusetts Institute of Technology, Cambridge	S. W. Stratton.
MICHIGAN	Michigan State College of Agriculture and Applied Science, East Lansing.	K. L. Butterfield.
MINNESOTA	Department of Agriculture of the University of Minnesota, University Farm, St. Paul.	W. C. Coffey.[2]
MISSISSIPPI	Mississippi Agricultural and Mechanical College, A. and M. College	B. M. Walker.
	Alcorn Agricultural and Mechanical College, Alcorn	L. J. Rowan.
MISSOURI	College of Agriculture of University of Missouri, Columbia	F. B. Mumford.[2]
	*School of Mines and Metallurgy of University of Missouri, Rolla.	A. L. McRae.[6]
	Lincoln University, Jefferson City	W. B. Jason.[4]
MONTANA	Montana State College of Agriculture and Mechanic Arts, Bozeman.	Alfred Atkinson.
NEBRASKA	College of Agriculture of University of Nebraska, Lincoln	W. W. Burr.[2]
NEVADA	College of Agriculture of University of Nevada, Reno	Robt. Stewart.[2]
NEW HAMPSHIRE	The University of New Hampshire, Durham	E. M. Lewis.
NEW JERSEY	State College of Agriculture and Mechanic Arts of Rutgers University and State University of New Jersey, New Brunswick.	J. G. Lipman.[2]
NEW MEXICO	New Mexico College of Agriculture and Mechanic Arts, State College.	H. L. Kent.
NEW YORK	New York State College of Agriculture, Ithaca	A. R. Mann.[2]
NORTH CAROLINA	North Carolina State College of Agriculture and Engineering, State College Station, Raleigh.	E. C. Brooks.
	Negro Agricultural and Technical College, Greensboro	F. D. Bluford.
NORTH DAKOTA	North Dakota Agricultural College, State College Station, Fargo	J. L. Coulter.
OHIO	College of Agriculture of Ohio State University, Columbus	Alfred Vivian.[2]
OKLAHOMA	Oklahoma Agricultural and Mechanical College, Stillwater	Bradford Knapp.
	Colored Agricultural and Normal University, Langston	Z. T. Hubert.
OREGON	Oregon State Agricultural College, Corvallis	W. J. Kerr.
PENNSYLVANIA	School of Agriculture of Pennsylvania State College, State College	R. L. Watts.[2]
PORTO RICO	College of Agriculture and Mechanic Arts of University of Porto Rico, Mayaguez.	C. A. Figueroa.[2]
RHODE ISLAND	Rhode Island State College, Kingston	Howard Edwards.
SOUTH CAROLINA	Clemson Agricultural College of South Carolina, Clemson College	E. W. Sikes.
	The Colored Normal, Industrial, Agricultural, and Mechanical College of South Carolina, Orangeburg.	R. S. Wilkinson.

[1] The name of the dean of the college of agriculture is given where that college is a part of a university.
[2] Dean.
[3] Superintendent.
[4] Acting president.
[5] Principal.
[6] Director.

List of Land-Grant Colleges in the United States—Continued

April, 1928—Continued

State or Territory	Name of institution and location	President
SOUTH DAKOTA	South Dakota State College of Agriculture and Mechanic Arts, Brookings.	C. W. Pugsley.
TENNESSEE	College of Agriculture of University of Tennessee, Knoxville	C. A. Willson.[2]
	Tennessee Agricultural and Industrial State College, Nashville	W. J. Hale.
TEXAS	Agricultural and Mechanical College of Texas, College Station	T. O. Walton.
	Prairie View State Normal and Industrial College, Prairie View	W. R. Banks.[5]
UTAH	Agricultural College of Utah, Logan	E. G. Peterson.
VERMONT	College of Agriculture of University of Vermont, Burlington	J. L. Hills.[2]
VIRGINIA	Virginia Agricultural and Mechanical College and Polytechnic Institute, Blacksburg.	J. A. Burruss.
	Virginia Normal and Industrial Institute, Ettricks	J. M. Gandy.
WASHINGTON	State College of Washington, Pullman	E. O. Holland.
WEST VIRGINIA	College of Agriculture of West Virginia University, Morgantown	N. J. Giddings.[7]
	West Virginia Collegiate Institute, Institute	J. W. Davis.
WISCONSIN	College of Agriculture of University of Wisconsin, Madison	H. L. Russell.[2]
WYOMING	College of Agriculture of University of Wyoming, Laramie	J. A. Hill.[2]

[2] Dean. [5] Principal. [7] Acting dean.

List of Agricultural Experiment Stations in the United States

April, 1928

This list gives the post-office addresses of the agricultural experiment stations in the United States, followed by the name of the director or other officer in charge:

ALABAMA—
(College station), Auburn: M. J. Funchess.
(Tuskegee station), Tuskegee Institute: G. W. Carver.
ALASKA—Sitka: H. W. Alberts.
ARIZONA—Tucson: J. J. Thornber.
ARKANSAS—Fayetteville: D. T. Gray.
CALIFORNIA—Berkeley: E. D. Merrill.
COLORADO—Fort Collins: C. P. Gillette.
CONNECTICUT—
State station, New Haven: }
Storrs station, Storrs: } W. L. Slate.
DELAWARE—Newark: C. A. McCue.
FLORIDA—Gainesville: Wilmon Newell.
GEORGIA—
(State station), Experiment: H. P. Stuckey
(Coastal Plain station), Tifton: S. H. Starr.
GUAM, ISLAND OF—Guam: C. W. Edwards.
HAWAII—
(Federal station), Honolulu: J. M. Westgate.
(Pineapple Canners' station), Honolulu: A. L. Dean.
(Sugar Planters' station), Honolulu: H. P. Agee.
IDAHO—Moscow: E. J. Iddings.
ILLINOIS—Urbana: H. W. Mumford.
INDIANA—La Fayette: G. I. Christie.
IOWA—Ames: C. F. Curtiss.
KANSAS—Manhattan: L. E. Call.
KENTUCKY—Lexington: T. P. Cooper.
LOUISIANA—
State station, Baton Rouge: }
Sugar station, Baton Rouge: }
North Louisiana station, Calhoun: } W. R. Dodson.
Rice station, Crowley: }
Fruit and Truck station, Hammond: }
MAINE—Orono: W. J. Morse.
MARYLAND—College Park: H. J. Patterson.
MASSACHUSETTS—Amherst: F. J. Sievers.
MICHIGAN—East Lansing: R. S. Shaw.
MINNESOTA—University Farm, St. Paul: W. C. Coffey.
MISSISSIPPI—A. and M. College: J. R. Ricks.
MISSOURI—
(College station), Columbia: F. B. Mumford.
(Fruit station), Mountain Grove: F. W. Faurot.
(Poultry station), Mountain Grove: T. W. Noland.
MONTANA—Bozeman: F. B. Linfield.
NEBRASKA—Lincoln: W. W. Burr.
NEVADA—Reno: S. B. Doten.
NEW HAMPSHIRE—Durham: J. C. Kendall.
NEW JERSEY—New Brunswick J. G. Lipman.
NEW MEXICO—State College: Fabian Garcia.
NEW YORK—
State station Geneva: }
Cornell station, Ithaca: } F. B. Morrison
NORTH CAROLINA—State College Station, Raleigh: R. Y. Winters.
NORTH DAKOTA—State College Station, Fargo: P. F. Trowbridge.
OHIO—Wooster: C. G Williams.

OKLAHOMA—Stillwater: C. T. Dowell.
OREGON—Corvallis: J. T. Jardine.
PENNSYLVANIA—
(College station), State College: R. L. Watts.
(Institute of Anima Nutrition), State College: E. B. Forbes.
PORTO RICO—
(Federa station), Mayaguez: D. W. May.
(Insular station), Rio Piedras: C. E. Chardon.
RHODE ISLAND—Kingston: B. E. Gilbert.[1]
SOUTH CAROLINA—Clemson College: H. W. Barre.
SOUTH DAKOTA—Brookings: J. W. Wilson.
TENNESSEE—Knoxville: C. A. Mooers.
TEXAS—College Station: A. B. Conner.[1]
UTAH—Logan: William Peterson.
VERMONT—Burlington: J. L. Hills.
VIRGINIA—
(College station), Blacksburg: A. W. Drinkard, jr.
(Truck station), Norfolk: T. C. Johnson.
VIRGIN ISLANDS, U S. A.—St. Croix: J. B. Thompson.
WASHINGTON—
(College station), Pullman: E. C. Johnson.
(Western Washington station), Puyallup: J. W. Kalkus.[3]
WEST VIRGINIA—Morgantown: N. J. Giddings.[1]
WISCONSIN—Madison: H. L. Russell.
WYOMING—Laramie: J. A. Hill.

National Forests

June 30, 1927

Forest	State in which located	Net area
		Acres
Absaroka	Montana	851, 046
Alabama	Alabama	107, 389
Allegheny	Pennsylvania	214, 506
Angeles	California	646, 312
Apache	Arizona and New Mexico.	1, 564, 253
Arapaho	Colorado	636, 506
Ashley	Utah and Wyoming	986, 792
Beartooth	Montana	660, 112
Beaverhead	do	1, 339, 172
Bellevue-Savanna.	Illinois	10, 710
Benning	Georgia	78, 560
Bighorn	Wyoming	1, 125, 632
Bitterroot	Montana	1, 047, 071
Blackfeet	do	832, 566
Black Hills	South Dakota and Wyoming.	622, 484
Boise	Idaho	1, 063, 313
Cabinet	Montana	829, 653
Cache	Idaho and Utah	778, 250
California	California	822, 996
Caribou	Idaho and Wyoming	709, 774
Carson	New Mexico	1, 088, 603
Cascade	Oregon	1, 023, 800
Challis	Idaho	1, 272, 023
Chelan	Washington	1, 807, 962
Cherokee	Georgia, North Carolina, and Tennessee.	295, 400
Chugach	Alaska	4, 792, 634
Clearwater	Idaho	793, 178
Cleveland	California	380, 569
Cochetopa	Colorado	908, 787
Coconino	Arizona	1, 717, 744
Coeur d'Alene	Idaho	657, 873
Colorado	Colorado	828, 744
Columbia	Washington	759, 430
Colville	do	747, 142
Coronado	Arizona and New Mexico.	1, 481, 811
Crater	California and Oregon.	853, 306
Crook	Arizona	1, 425, 166
Custer	Montana and South Dakota.	591, 309
Datil	New Mexico	1, 748, 654
Deerlodge	Montana	828, 834
Deschutes	Oregon	1, 296, 142
Dix	New Jersey	6, 785
Dixie	Nevada and Utah	851, 954
Eldorado	California and Nevada.	551, 878
Eustis	Virginia	4, 220
Fishlake	Utah	1, 386, 459
Flathead	Montana	1, 719, 112
Florida	Florida	343, 180
Fremont	Oregon	849, 286
Gallatin	Montana	581, 002
Gila	New Mexico	1, 596, 229
Grand Mesa	Colorado	659, 384
Gunnison	do	905, 265
Harney	South Dakota	513, 494
Hayden	Colorado and Wyoming.	393, 553
Helena	Montana	682, 482
Holy Cross	Colorado	1, 125, 174
Humboldt	Nevada	1, 322, 313
Humphreys	Virginia	3, 184
Idaho	Idaho	1, 688, 056
Inyo	California and Nevada.	1, 585, 664
Jackson	South Carolina	20, 225
Jefferson	Montana	1, 040, 310
Kaibab	Arizona	723, 411
Kaniksu	Idaho and Washington.	465, 427
Klamath	California and Oregon.	1, 533, 596
Knox	Kentucky	22, 660
Kootenai	Montana	1, 351, 165
La Sal	California and Utah	530, 922
Lassen	California	944, 932
Leadville	Colorado	927, 413
Lee	Virginia	7, 177
Lemhi	Idaho	1, 358, 772
Lewis and Clark	Montana	810, 731
Lincoln	New Mexico	1, 113, 559
Lolo	Montana	851, 249
Luquillo	Porto Rico	12, 443
Madison	Montana	953, 456
Malheur	Oregon	1, 048, 666
Manti	Utah	725, 476
Manzano	New Mexico	679, 610
McClellan	Alabama	15, 350
Meade	Maryland	4, 725
Medicine Bow	Wyoming	552, 275
Michigan	Michigan	126, 762
Minidoka	Idaho and Utah	591, 184
Minnesota	Minnesota	191, 025

[1] Acting director.
[3] Superintendent.

National Forests—Continued

June 30, 1927—Continued

Forest	State in which located	Net area
		Acres
Missoula	Montana	1,024,026
Modoc	California	1,475,759
Mono	California and Nevada.	1,260,721
Monongahela	Virginia and West Virginia.	176,053
Montezuma	Colorado	697,582
Mount Baker	Washington	1,460,651
Mount Hood	Oregon	1,059,852
Nantahala	Georgia, North Carolina, and South Carolina.	247,919
Natural Bridge	Virginia	157,246
Nebraska	Nebraska	205,946
Nevada	Nevada	1,175,128
Nezperce	Idaho	1,661,503
Ochoco	Oregon	718,137
Olympic	Washington	1,529,501
Ouachita	Arkansas	665,784
Ozark	do	316,970
Payette	Idaho	1,307,555
Pend Oreille	do	676,572
Pike	Colorado	1,087,115
Pine Plains	New York	9,800
Pisgah	North Carolina and Tennessee.	278,768
Plumas	California	1,109,600
Powell	Utah	1,051,505
Prescott	Arizona	1,207,706
Rainier	Washington	1,261,558
Rio Grande	Colorado	1,135,764
Routt	do	750,254
Salmon	Idaho	1,708,374
San Bernardino	California	597,359
San Isabel	Colorado	599,416
San Juan	do	1,241,720
Santa Barbara	California	1,775,076
Santa Fe	New Mexico	1,270,195
Santiam	Oregon	610,918
Sawtooth	Idaho	1,158,262
Selway	do	1,689,157
Sequoia	California	1,342,430
Shasta	do	870,034
Shenandoah	Virginia and West Virginia.	421,105
Shoshone	Wyoming	1,619,796
Sierra	California	1,493,513
Siskiyou	California and Oregon.	1,362,134
Sitgreaves	Arizona	673,921
Siuslaw	Oregon	549,774
Snoqualmie	Washington	612,195
Stanislaus	California	811,292
St. Joe	Idaho	555,114
Superior	Minnesota	810,017
Tahoe	California and Nevada.	532,030
Targhee	Idaho and Wyoming.	1,376,941
Teton	Wyoming	1,881,212
Tobyhanna	Pennsylvania	20,870
Toiyabe	Nevada	1,883,690
Tongass	Alaska	16,547,758
Tonto	Arizona	2,261,147
Trinity	California	1,410,460
Tusayan	Arizona	1,292,992
Uinta	Utah	1,076,626
Umatilla	Oregon and Washington.	1,234,256
Umpqua	Oregon	1,014,174
Unaka	North Carolina, Tennessee, and Virginia.	158,082
Uncompahgre	Colorado	754,291
Wallowa	Oregon	961,701
Wasatch	Utah	609,767
Washakie	Wyoming	867,899
Weiser	Idaho	565,945
Wenatchee	Washington	860,405
White River	Colorado	884,565
Whitman	Oregon	1,338,184
White Mountain.	Maine and New Hampshire.	459,581
Wichita	Oklahoma	61,480
Wyoming	Wyoming	1,668,288

Federal Bird Refuges and Game Preserves

DEPARTMENT OF AGRICULTURE

Designation	Number on map	Acres	Chief species protected
Biological Survey			
ALABAMA:			
Petit Bois Island	63	635	Laughing gulls, least terns, black skimmers, Louisiana herons.
ALASKA:			
Alaska Railway Muskrat and Beaver Preserve.		4,160	Muskrats, beavers.
Aleutian Islands			Puffins, auklets, murres, gulls, ducks, geese, ptarmigan, blue foxes.
Bering Sea (St. Matthews and Hall Islands).			Puffins, auklets, kittiwakes, glaucous gulls, sandpipers, snow buntings.
Bogoslof			Sea lions, auklets, murres, gulls.
Chamisso Island			Horned puffins, Pallas murres, Pacific kittiwakes, glaucous gulls.
Curry Bird, Game, and Fish Refuge.		8,960	Grouse, ptarmigan, black bears, foxes, lynxes, minks, ermines, fishes.
Forrester Island			Puffins, auklets, murrelets, murres, guillemots, gulls, petrels, cormorants.
Hazy Islands			Puffins, auklets, murres, guillemots, gulls, cormorants.

Federal Bird Refuges and Game Preserves—Continued

DEPARTMENT OF AGRICULTURE—Continued

Designation	Number on map	Acres	Chief species protected
Biological Survey—Contd.			
ALASKA—Continued.			
St. Lazaria			Puffins, auklets, murres, guillemots, gulls, petrels, cormorants.
Tuexdni			Pacific kittiwakes, glaucous-winged gulls, eider ducks.
ARIZONA:			
Salt River	27	21,120	Cormorants, white pelicans, waterfowl.
ARKANSAS:			
Big Lake	70	7,774	Ducks of many species.
CALIFORNIA:			
Clear Lake	52	33,840	Gulls, cormorants, ducks, geese, herons.
Farallon	49		Puffins, auklets, guillemots, murres, gulls, cormorants.
FLORIDA:			
Brevard	77	12	Brown pelicans.
Caloosahatchee	73		Ducks, herons.
Indian Key	7	90	Pelicans, white ibises, egrets, Louisiana and little blue herons.
Island Bay	24		Brown pelicans, herons.
Key West	17		Cormorants, pelicans, man-o'-war birds, roseate spoonbills, white ibises, herons.
Matanzas	84		Terns, shearwaters.
Matlacha Pass	23		Cormorants, pelicans, herons.
Mosquito Inlet	15		Least terns, pelicans, herons.
Palma Sola	22		Man-o'-war birds, herons.
Passage Key	6	5	Laughing gulls, terns, skimmers, cormorants, sandpipers.
Pelican Island	1	6	Brown pelicans.
Pine Island	21		Pelicans, herons.
Tortugas Keys	16	141	Sooty and noddy terns.
GEORGIA:			
Blackbeard Island	66	1,600	White-tailed deer, raccoons, opossums, herons, cranes.
HAWAII:			
Hawaiian Islands			Terns, albatrosses, shearwaters, petrels, gannets, man-o'-war birds, Laysan teal, rails, and finches.
Johnston Island			Sooty and noddy terns, shearwaters, petrels, boobies, man-o'-war birds.
IDAHO:			
Deer Flat	29	12,300	Ducks, geese, pheasants.
Minidoka	43	13,240	Grebes, Forster terns, cormorants, ducks, coots, avocets, sage hens.
ILLINOIS:			
Upper Mississippi River Wild Life and Fish Refuge (see Minnesota).	(1).		
IOWA:			
Upper Mississippi River Wild Life and Fish Refuge (see Minnesota).	(1)		
LOUISIANA:			
Breton Island	2		Laughing gulls, royal and Cabot terns, skimmers, herons, willets.
East Timbalier	14	63	Gulls, royal terns, skimmers, pelicans, herons, clapper rails.
Shell Keys	9		Royal terns, brown pelicans, man-o'-war birds.
Tern Islands	8		Laughing gulls, royal, Cabot, and Forster terns, brown pelicans.
MICHIGAN:			
Huron Islands	4	83	Herring gulls, ducks.
Siskiwit Islands	5	9	Do.
MINNESOTA:			
Mille Lacs	69	7	Gulls, ducks, geese.
Upper Mississippi River Wild Life and Fish Refuge (in the States of Illinois, Iowa, Minnesota, and Wisconsin).	(1)		Ducks, geese, muskrats, minks, raccoons, beavers, fishes, mollusks.
MONTANA:			
National Bison Range	16½	18,522	Buffalo, elk, deer, mountain sheep, grouse, pheasants.
Nine Pipe	74		Ducks, coots.
Pablo	75		Do.
Pishkun	58	3,160	Gulls, ducks, geese, swans.
Willow Creek	30	3,200	Ducks, geese.

[1] In process of establishment.

Federal Bird Refuges and Game Preserves—Continued

DEPARTMENT OF AGRICULTURE—Continued

Designation	Number on map	Acres	Chief species protected
Biological Survey—Continued			
NEBRASKA:			
Niobrara	55	16,125	Buffalo, elk, deer, antelope, prairie chickens, sharp-tailed grouse.
North Platte	72	5,107	Ducks, geese, swans, shorebirds.
NEVADA:			
Anaho Island	64	248	Gulls, cormorants, white pelicans.
NEW MEXICO:			
Carlsbad	31	18,680	Ducks, shorebirds.
Rio Grande	32	55,680	Grebes, cormorants, ducks, geese, shorebirds.
NORTH DAKOTA:			
Chase Lake	20	2,839	Gulls, white pelicans, ducks, shorebirds, grouse.
Stump Lake	3	23	Western grebes, gulls, terns, ducks, Wilson phalaropes.
Sullys Hill National Game Preserve.	65½	700	Buffalo, elk, deer, antelope, golden-eye and wood ducks, geese, pheasants.
OREGON:			
Cold Springs	33	2,520	Ducks, geese, swans, herons, sharp-tailed grouse.
Klamath Lake	18	81,619	Ducks, geese, coots, gulls, shorebirds.
Lake Malheur	19	88,960	Gulls, cormorants, pelicans, ducks, geese, swans, herons, avocets.
McKay Creek	83	1,813	Ducks, geese.
Three Arch Rocks	10	----------	Puffins, guillemots, murres, gulls, fork-tailed and Kaeding petrels, cormorants.
Upper Klamath Wild Life Refuge	85	8,140	Ducks, geese.
PORTO RICO:			
Culebra	-------	----------	Gulls, royal terns, Bahama ducks, herons, coots, ground doves.
Desecheo Island	-------	----------	Terns, boobies, gannets, man-o'-war birds, oyster-catchers.
SOUTH CAROLINA:			
Savannah River	82	2,352	Ducks, shorebirds.
SOUTH DAKOTA:			
Belle Fourche	34	13,680	Ducks, geese, curlews, prairie chickens, pheasants.
Wind Cave National Game Preserve.	56½	4,160	Buffalo, elk, antelope, grouse, quail.
UTAH:			
Strawberry Valley	35	14,080	Ducks, sage hens.
WASHINGTON:			
Columbia River	79	8	Gulls, ducks, geese, herons.
Conconully	40	1,120	Ducks, sooty and sharp-tailed grouse, Hungarian partridges.
Copalis Rock	13	5	Puffins, murres, glaucous and western gulls, petrels, cormorants.
Dungeness Spit	67	227	Grebes, loons, gulls, ducks.
Ediz Hook	68	84	Pigeon guillemots, California murres, cormorants.
Flattery Rocks	11	68	Tufted puffins, pigeon guillemots, California murres.
Smith Island	65	5,600	Western grebes, pigeon guillemots, California murres, cormorants, ducks.
Quillayute Needles	12	117	Grebes, auklets, glaucous-winged and western gulls, cormorants, ducks.
WISCONSIN:			
Gravel Island (Lake Michigan).	60	----------	Herring gulls.
Green Bay	56	----------	Do.
Upper Mississippi River Wild Life and Fish Refuge (see Minnesota).	(1)		
WYOMING:			
Elk Refuge	68½	2,760	Elk (in winter), ducks, geese, sage hens.
Flat Creek	76	40	Elk (in winter), ducks, geese.
Forest Service [2, 3]			
ARIZONA:			
Grand Canyon National Game Preserve (Kaibab and Tusayan Forests).	103	792,163	Mule deer, mountain sheep, Kaibab squirrels, dusky grouse.
ARKANSAS:			
Ozark National Game Refuges Nos. 1, 2, 3, and 4 (Ozark Forest).	108	21,500	White-tailed deer, bobwhite quail, turkeys.
CALIFORNIA:			
Mineral King Game Refuge (Sequoia Forest).	109	16,300	Mule deer, grouse, quail, fur animals.

[1] In process of establishment.
[2] On national monuments administered by the National Park Service and by the Forest Service birds and animals are also protected under Federal law, although these are not strictly game preserves or bird refuges.
[3] See also game preserves on military reservations administered as national forests.

Federal Bird Refuges and Game Preserves—Continued

DEPARTMENT OF AGRICULTURE—Continued

Designation	Number on map	Acres	Chief species protected
Forest Service—Continued			
GEORGIA:			
Cherokee National Game Refuge No. 2 (Cherokee Forest).	106	14,000	White-tailed deer, quail, turkeys.
NORTH CAROLINA:			
Pisgah National Game Preserve (Pisgah Forest).	102	98,381	Buffalo, elk, white-tailed deer, quail, turkeys.
OKLAHOMA:			
Wichita National Game Preserve (Wichita Forest).	100	60,800	Buffalo, elk, white-tailed deer, antelope, ducks, quail, turkeys.
SOUTH DAKOTA:			
Custer State Park Game Sanctuary (Harney Forest).	104	44,360	Deer, mountain goats, mountain sheep, elk, dusky grouse, ruffed grouse.
TENNESSEE:			
Cherokee National Game Refuge No. 1 (Cherokee Forest).	105	30,000	White-tailed deer, quail, turkeys.
WASHINGTON:			
Mount Olympus National Monument (Olympic Forest).[2]	101	299,370	Olympic elk, black-tailed deer, bears, grouse.
WYOMING:			
Sheep Mountain Game Refuge (Medicine Bow Forest).	107	28,318	Elk, mule deer, grouse.

DEPARTMENT OF COMMERCE

Designation	Number on map	Acres	Chief species protected
Bureau of Fisheries			
ALASKA:			
Afognak Forest and Fish Cultural Reserve.	-------	512,000	Sea otters.
Pribilof Islands	-------	49,000	Fur seals, sea lions, sea otters, puffins, auklets, murres, gulls fulmars, cormorants, Pribilof sandpipers.
Bureau of Lighthouses			
CALIFORNIA:			
Año Nuevo Island Lighthouse Reservation	135	----------	Sea lions
South Farallon Island Lighthouse Reservation (see Navy Department).	133	120	Sea lions, puffins, auklets, guillemots gulls, petrels, cormorants.
LOUISIANA:			
Chandeleur Lighthouse Reservation.	130	5,000	Laughing gulls, terns, skimmers, pelicans
Errol Island	134	640	Laughing gulls, terns, skimmers.
WASHINGTON:			
New Dungeness Lighthouse Reservation.	131	190	Grebes, loons, gulls, ducks.
Smith Island Lighthouse Reservation.	132	5,600	Grebes, puffins, murres, gulls, cormorants, geese, ducks.

DEPARTMENT OF THE INTERIOR

Designation	Number on map	Acres	Chief species protected
National Park Service[2]			
ALASKA:			
Glacier Bay National Monument.	-------	1,164,800	Puffins, pigeon guillemots, gulls, terns, cormorants, eider ducks, mountain goats, bears.
Katmai National Monument.	-------	1,087,990	Brown bears, foxes, waterfowl.
Mount McKinley National Park.	-------	1,692,800	Mountain sheep, caribou, moose, bears, grouse.

[2] On national monuments administered by the National Park Service and by the Forest Service birds and animals are also protected under Federal law, although these are not strictly game preserves or bird refuges.

Federal Bird Refuges and Game Preserves—Continued

DEPARTMENT OF INTERIOR—Continued

Designation	Number on map	Acres	Chief species protected
National Park Service—Con.			
ARIZONA:			
Grand Canyon National Park.	160	613, 120	Mountain sheep, mule deer, antelope, beavers, squirrels, dusky grouse.
Papago Saguaro National Monument.	154	1, 940	Nongame birds.
Petrified Forest National Monument.	150	26, 625	Do.
CALIFORNIA:			
General Grant National Park.	141	2, 536	Mule deer, quail, grouse.
Lassen Volcanic National Park.	156	79, 562	Mule deer, bears, quail, grouse.
Muir Woods National Monument.	151	426	Deer, nongame birds.
Sequoia National Park	142	161, 597	Deer, elk, bears, quail, grouse.
Yosemite National Park	143	719, 802	Deer, bears, quail, grouse.
COLORADO:			
Colorado National Monument.	153	13, 883	Mule deer.
Mesa Verde National Park.	149	48, 966	Elk, mule deer, bears.
Rocky Mountain National Park.	155	253, 782	Elk, mule deer, sheep, bears, beavers, sooty grouse.
HAWAII:			
Hawaii National Park		118, 695	Hawaiian geese, nongame birds.
IDAHO:			
Yellowstone National Park (see Montana and Wyoming).	140	23, 040	
MAINE:			
Lafayette National Park	161	5, 404	White-tailed deer, beavers, ducks, geese, grouse.
MONTANA:			
Glacier National Park	152	981, 681	Deer, elk, moose, sheep, bears, ducks, geese, grouse, ptarmigan.
Yellowstone National Park (see Idaho and Wyoming).	140	126, 720	
NORTH DAKOTA:			
Sullys Hill National Park	148	780	(See Sullys Hill National Game Preserve, administered by Bureau of Biological Survey, Department of Agriculture.)
OKLAHOMA:			
Platt National Park	146	849	Buffalo, elk, white-tailed deer.
OREGON:			
Crater Lake National Park.	145	159, 359	Black-tailed deer, elk, bears, grouse.
SOUTH DAKOTA:			
Wind Cave National Park.	147	10, 900	Grouse. (See also Wind Cave National Game Preserve, administered by Biological Survey.)
UTAH:			
Zion National Park	162	76, 800	Deer, grouse.
WASHINGTON:			
Mount Rainier National Park.	144	207, 360	Black-tailed deer, Rocky Mountain goats, bears, grouse.
WYOMING:			
Yellowstone National Park (see Idaho and Montana).	140	1, 992, 960	Buffalo, mountain sheep, antelope, mule deer, white-tailed deer, moose, bears, pelicans, ducks, geese, swans, dusky, and ruffed grouse.

NAVY DEPARTMENT [4]

CALIFORNIA:			
South Farallon (see Department of Commerce, Bureau of Lighthouses).	170	10	Cormorants and sea birds.
HAWAII:			
Midway Islands			Albatrosses, Laysan rails, Laysan finches.
VIRGINIA:			
Naval Operation Base (Hampton Roads).	172	945	Rabbits, quail.
Navy Mine Depot (Yorktown).	173	12, 467	Rabbits, quail, turkeys.

[4] Birds are protected also at the naval ammunition depot, St. Juliens Creek, Va. (221.6 acres), and at the Norfolk (Va.) Navy Yard (361.6 acres), by order of the commandant, Fifth Naval District.

Federal Bird Refuges and Game Preserves—Continued

WAR DEPARTMENT [5]

Designation	Number on map	Acres	Chief species protected
GEORGIA:			
Chickamauga and Chattanooga National Military Park (see Tennessee).	180	6,542	Rabbits, gray squirrels, quail.
MICHIGAN:			
Brady District [6]	183	2,680	
MISSISSIPPI:			
Vicksburg National Military Park.	182	1,323	Squirrels, opossums, rabbits, raccoons, foxes, quail.
NEW MEXICO:			
Zuni District [6]	184	45,423	
PENNSYLVANIA:			
Tobyhanna Forest [6]	185	20,870	
SOUTH CAROLINA:			
Jackson Forest [6]	186	20,225	
SOUTH DAKOTA:			
Meade District [6]	187	5,548	
TENNESSEE:			
Chickamauga and Chattanooga National Military Park (see Georgia).	180	Roads only.	Rabbits, gray squirrels, quail.
Shiloh National Military Park.	181	3,546	Foxes, raccoons, opossums, squirrels, muskrats, weasels, skunks, minks.
VIRGINIA:			
Lee Forest [6]	188	7,177	
WYOMING:			
Pole Mountain District [6]	189	56,132	

[5] On three other national military parks also—Antietam Battlefield, Guilford Courthouse, and Gettysburg—and on national cemeteries birds receive protection.
[6] Game preserve on military reservation administered as national forest by order of the Secretaries of War and Agriculture.

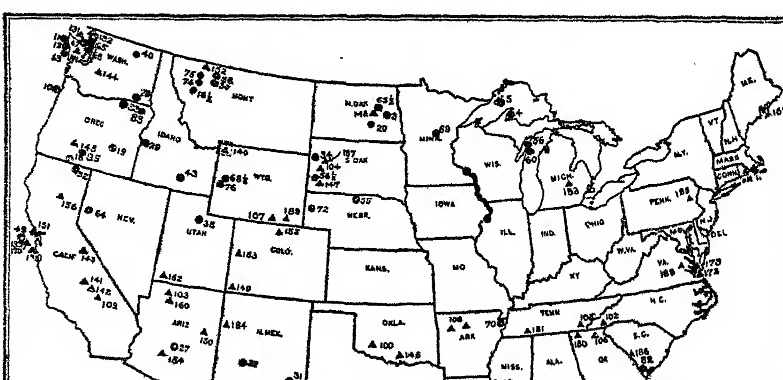

FIG. 294.—Location of the Federal bird refuges and game preserves listed on pages 729 to 734. To ascertain the names of the wild-life reservations in any State, refer in the list to the corresponding number under that State. Those numbered under 100 were established primarily for the protection of their wild life and will be found in the list administered by the Biological Survey; those numbered above 100 are of reservations established primarily for other purposes and the wild life is administered incidentally by the agency in charge of the area. In addition to the refuges and preserves shown on the map, reservations are included in the list for Alaska, Hawaii, and Porto Rico

AGRICULTURAL STATISTICS

UNITED STATES DEPARTMENT OF AGRICULTURE YEARBOOK, 1927

Prepared under the direction of the Statistical Committee: O. C. Stine, chairman, J. Clyde Marquis, C. F. Sarle, S. W. Mendum, and Lewis B. Flohr, secretary

INTRODUCTION

The statistical section of this yearbook brings together in one place what seems from experience to be the most important agricultural statistics for the United States by States, and for the world so far as the agriculture of this country is concerned, for series of years ending with the crop year 1926–27 or the calendar year 1927. Historical series going back to 1867 are shown for major crops and animals. For the major grain crops, acreage, yield, production, farm, market, and some foreign prices, farm values, abandonment figures when pertinent, monthly marketings, supply, distribution, and per capita disappearance as available, farm stocks, receipts at primary markets, visible supply, inspection for export, and international trade are shown. Other field crops, fruits and vegetables, livestock and livestock products are covered in a similar manner.

Returns from farming, cost of production, cost of living, wages, labor, population, freight rates, revenue from motor vehicles, lumber production, forestry, temperature and rainfall, and many other subjects contributing to an understanding of agricultural conditions are statistically presented.

These are basic data helpful to the producer in his problems of production and marketing of agricultural commodities. They supply significant foundation material for the analysis of price trends, shifts in production, increasing or decreasing domestic consumption or demand, potential consumption, relationships of price to changes in production, source of foreign competition and possible new foreign markets. Such data for the current year as are preliminary and subject to revision on the basis of later and fuller information are revised in the subsequent issue of the Yearbook.

For greater detail on individual commodities than can be shown in the Yearbook, Statistical Bulletin series of the department may be consulted. This series of bulletins, each dealing with a single product or group of products, now includes 24 numbers and others are in preparation.

For current statistics to supplement the Yearbook statistics the following sources should be used: (1) Crops and Markets—a monthly publication of the department carrying the latest current statistics available on agriculture in the United States; (2) Foreign Crops and Markets—issued weekly by the Bureau of Agricultural Economics and devoted to current world statistics of crops, livestock, and markets; (3) Foreign Commodity News—published by the Bureau of Agricultural Economics and showing the latest world information on single commodities and released as important information is received; (4) market news reports of the Bureau of Agricultural Economics—issued daily, weekly, monthly, quarterly, or at irregular intervals, at the principal markets.

The bureaus of the department represented in the statistical compilations of the present Yearbook are: Weather Bureau, Bureau of Animal Industry, Forest Service, Bureau of Public Roads, Bureau of Agricultural Economics, and Grain Futures Administration.

The Bureau of Agricultural Economics has such a varied field of activities that it seems desirable to indicate briefly the sources of information within that bureau.

The Federal market news system supplies much price and market information presented here. The service is coordinated in the Bureau of Agricultural Economics in Washington, but the reports are distributed from the market news branch offices. The leased-wire system in use by the service extends from Boston through the principal markets such as New York, Baltimore, Pittsburgh, Cincinnati, Chicago, St. Louis, Kansas City, and Denver to San Francisco on the west coast. Branches extend to Minneapolis, Atlanta, Jacksonville, and Fort Worth. In each of the branch offices commodity specialists gather information regarding the supply, the demand, and prices for the products on which they report. They observe the sales actually made on the markets or in the stockyards and are constantly in touch with the traders who in many instances

give them access to their office records in order that they may have specific information on which to base their reports.

The fruits and vegetables market news service covers car-lot shipments, car-lot unloads, and prices. Car-lot shipments are reported by officials and agents of railroads, express companies, and boat lines. Car-lot unloads information is obtained by representatives of the bureau in the larger markets of the country from railroad, express company, and boat line officials. Prices shown are those at which fruits and vegetables sell in large terminal markets and usually represent prices received by the wholesale carload receiver who sells to jobbers or other purchasers in large less than carload lots.

The dairy and poultry service obtain the statistics of receipts from reports made by the railroads direct to the Bureau of Agricultural Economics, through its local offices in the cities concerned. This information is collected daily. Current storage stocks of dairy and poultry products are obtained directly by telegraph from the storage warehouses daily at New York, Boston, Philadelphia, Chicago, San Francisco, Providence, Pittsburgh, Buffalo, St. Louis, Kansas City, and Omaha; weekly at Syracuse, Cuba, and Lowville, N. Y.; Detroit; Cleveland; Milwaukee, Plymouth, Green Bay, and Marshfield, Wis.; Minneapolis; St. Paul; Denver; Seattle; Portland; and Los Angeles. Prices reported at terminal markets are obtained by personal interview of employees of the bureau with buyers and sellers, and represent the majority of sales reported.

The market news service on livestock, meats, and wool receives statistics of receipts, slaughter, and shipment of livestock from monthly reports submitted by the public stockyards. Its price reports are based on information gathered by bureau reporters in the large markets who observe trade conditions, discuss the market with buyers and sellers, and on the basis of all information they gather quote a daily range of prices for individual grades or groups of grades.

The grain, hay, feed, and seed market news reports are based on current information from reporters in the leading markets.

The statistics of grain grading are based on work done by licensed grain inspectors located throughout the United States.

The crop and livestock reporting service estimates acreage, condition of crop, yield per acre, production, and prices of crops, and numbers, prices, and values of livestock. The organization of this work outside of the crop reporting board and the office force in Washington consists of 41 State field officers, with an agricultural statistician in charge. There is one field office for the New England States and also one for New Jersey and Delaware. There is a duel system of agricultural correspondents and reporters distributed over the country. One group sends their reports to the local State field office and the other group directly to the Bureau in Washington.

Acreages for the year 1909 are as reported by the Bureau of the Census; acreages in 1919 and in 1924 are based upon the census, (preliminary for 1924 in some States) supplemented by State enumerations. In the intercensal years, from 1911 to 1915, estimated acreages were obtained by applying estimated percentages of decrease or increase to the published acreage in the preceding year. The estimates from 1915 to 1918, from 1919 to 1923, and for 1925 and 1926 are based upon acreage changes from year to year as shown by a sample of approximately 2 per cent of the crop acreages in each year, supplemented by State enumerations. Yields per acre are estimates based upon reports of one or more farmers in each agricultural township on the average yield per acre in their localities. Production is acreage times yield per acre.

Estimates of farm stocks, shipments, quality, crop condition, and miscellaneous information concerning crops are based either upon sample data or upon estimates of crop reporters for their localities. The sources of these data are indicated in the notes accompanying the tables.

Monthly estimated prices received by producers on the specified dates are based upon reports from special price reporters, who are mostly country dealers, on the average price paid to farmers and do not relate to any specified grade. They are indices of price trend rather than prices actually received.

Farm value as shown is computed by applying the December 1 farm price to the total production. (The prices ore reported by the crop reporters, who are largely farmers.) The average price received for the portion of the crop sold may be greater or less than this price, depending upon the price changes previous and subsequent to December 1 and the amount of the crop sold at the different prices.

Numbers of livestock on farms in 1910 correspond to the census enumeration as of April 15 in that year. The numbers on January 1, 1920 and 1925, are based upon the census enumeration (preliminary for 1925 in some States) as of that

date, supplemented by enumerations by State agencies, such as assessors and brand inspection boards, and by records of shipments during 1920 and 1925. In the intercensal years, from 1911 to 1916, the numbers of livestock were obtained by methods identical with those used for crop acreages. Estimates from 1917 to 1919, from 1920 to 1923, and for 1926 and 1927 are based upon a sample of approximately 2 per cent, supplemented by trends derived from assessors' enumerations, reports of brand inspection boards, market movements, and stockyard receipts. The census bases are not always comparable from one decade to another, due both to changes of dates and classifications.

The average value per head on January 1 is estimated from reports of correspondents relating to livestock in their vicinity. These tend to reflect inventory values as distinguished from the monthly prices which relate to sales. The farm value on January 1 is computed by applying the average value per head to the number of head on farms.

Market prices as shown are weighted averages in all cases where a weighting factor was available. For instance, the weighted price of wheat in Chicago is based on the number of carload sales reported, which range from 42 to 55 per cent of all receipts on that market. In the case of hogs at Chicago, the weighted average price is based on total sales of butcher hogs to slaughterers. With many commodities, however, data as to quantities sold are unobtainable; in all such cases average prices are based on price quotations without reference to quantity.

Due to changes in market conditions or quality of delivery in different years on or under the same grade description or specifications, prices derived from different sources may not be strictly comparable, although for most general purposes they are satisfactory. For instance, the changes in the description of many kinds of livestock which were made July 1, 1925, while not affecting certain price series, made others only fairly comparable and made comparison impossible in other cases. The data as to commercial stocks and movements of various commodities are as nearly complete as practicable and feasible, and are considered fairly representative.

Statistics of acreage and production in foreign countries are compiled as far as possible from official sources and are therefore subject to whatever errors may result from shortcomings in the reporting and statistical services of the various countries. Inaccuracies also result from differences in nomenclature and classification in foreign countries, and through the conversion of foreign units into domestic equivalents. Except where otherwise stated, pre-war data refer to pre-war boundaries. Yields per acre are calculated from acreage and production, both rounded to thousand units, and are therefore subject to a greater possibility of error when calculated for countries with small acreage.

The tables of international trade cover substantially the international trade of the world. The total imports and the total exports in any one year can not be expected to balance, although disagreements tend to be compensated over a series of years. Among the sources of disagreement are: The different periods covered by the "year" of various countries; imports received in the year subsequent to the year of export; lack of uniformity in classification of goods as among countries; different trade practices and varying degrees of failure in recording countries of origin and ultimate destination; different practices in recording reexported goods; and different methods of treating free ports. The exports given are domestic exports and the imports given are imports for consumption, whenever it is possible to distinguish such imports from general imports. While there are some inevitable omissions, there may be some duplication because of reshipments which do not appear as such in the official reports. In the trade tables, figures for the United States include Alaska, Porto Rico, and Hawaii, but not the Philippine Islands.

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STATISTICS OF GRAINS

TABLE 1.—*Wheat: Acreage, production, value, exports, etc., United States, 1849, 1859, 1866–1927*

Year	Acreage harvested	Average yield per acre	Production	Price per bushel received by producers Dec. 1	Farm value Dec. 1	Value per acre [1]	Spring wheat, price per bushel at Chicago, year beginning July 1 [2]	No. 2 red winter wheat, price per bushel at Chicago, year beginning July 1 [3]	Foreign trade, including flour, year beginning July 1 [4]			
									Domestic exports [5]	Imports	Net exports [6]	
											Total	Percentage of production
	1,000 acres	*Bus.*	*1,000 bus.*	*Cts.*	*1,000 dolls.*	*Dolls.*	*Cts.*	*Cts.*	*1,000 bus.*	*1,000 bus.*	*1,000 bus.*	*Per cent*
1849	------	------	*100,486*	------	------	------	66	------	7,536	2,913	5,701	5.7
1859	------	------	*173,105*	------	------	------	90	82	17,213	[7] 4,493	[7] 12,720	7.3
1866	15,424	9.9	152,000	152.7	232,110	15.05	219	94	12,647	3,093	10,828	7.1
1867	18,322	11.6	212,441	145.2	308,387	16.83	198	145	26,323	2,014	24,550	11.6
1868	18,460	12.1	224,037	108.5	243,033	13.17	134	123	29,717	1,830	28,314	12.6
1869	------	------	*287,746*	------	------	------	------	------	------	------	------	------
1869	19,181	13.6	260,147	76.5	199,025	10.38	98	84	53,901	1,286	53,126	20.4
1870	18,993	12.4	235,885	94.4	222,767	11.73	116	84	52,574	867	52,195	22.1
1871	19,944	11.6	230,722	114.5	264,076	13.24	124	109	38,996	2,411	37,587	16.3
1872	20,858	12.0	249,997	111.4	278,522	13.35	121	111	52,015	1,841	50,705	20.3
1873	22,172	12.7	281,255	106.9	300,670	13.56	116	103	91,510	2,117	90,418	32.1
1874	24,967	12.3	308,103	86.3	265,881	10.65	95	98	72,913	368	72,845	23.6
1875	26,382	11.1	292,136	89.5	261,397	9.91	106	86	74,751	1,664	74,508	25.5
1876	27,627	10.5	289,356	97.0	280,743	10.16	122	92	57,044	366	57,148	19.8
1877	26,278	13.9	364,194	105.7	385,089	14.65	111	121	92,142	1,391	92,028	25.3
1878	32,109	13.1	420,122	77.6	325,814	10.15	90	95	150,503	2,074	150,253	35.8
1879	*35,430*	*13.0*	*459,483*	------	------	------	------	------	------	------	------	------
1879	35,430	14.1	499,893	110.6	552,884	15.60	110	99	181,807	487	181,951	36.4
1880	37,987	13.1	498,550	95.1	474,202	12.48	100	105	188,308	212	188,250	37.8
1881	37,709	10.2	383,280	119.2	456,880	12.12	128	115	123,371	867	123,211	32.1
1882	37,067	13.6	504,185	88.4	445,602	12.02	105	118	150,113	1,088	150,000	29.8
1883	36,456	11.6	421,086	91.1	383,649	10.52	93	102	113,822	33	113,892	27.0
1884	39,476	13.0	512,765	64.5	330,862	8.38	79	83	135,232	213	135,301	26.4
1885	34,189	10.4	357,112	77.1	275,320	8.05	81	88	96,611	389	96,569	27.0
1886	36,806	12.4	457,218	68.7	314,226	8.54	77	76	156,685	283	156,760	34.3
1887	37,642	12.1	456,329	68.1	310,613	8.25	75	75	122,616	596	122,524	26.8
1888	37,336	11.1	415,868	92.6	385,248	10.32	95	88	90,944	136	91,030	21.9
1889	*33,580*	*13.9*	*468,374*	------	------	------	------	------	------	------	------	------
1889	33,580	12.9	434,383	69.5	301,869	8.90	81	86	112,488	163	112,507	25.9
1890	34,048	11.1	378,097	83.3	315,112	9.25	97	89	109,017	586	109,054	28.8
1891	37,826	11.5	584,504	83.4	487,403	12.89	89	96	229,465	2,463	228,841	39.2

[1] Based on price received by producers Dec. 1.

[2] Spring wheat prices compiled as follows: 1839–1870, from Chicago newspapers, quoted; 1839–1849, spring wheat, contract grade; 1859, standard spring, contract grade; 1866–1870, No. 1 spring, contract grade; 1871–1884, annual reports of Chicago Board of Trade, quoted as No. 2 spring, contract grade; 1885–1896, Bartel's Red Book, quoted as No. 2 spring; January, 1897–June, 1904, Chicago Daily Trade Bulletin, average of daily ranges; quotations used; January–October, 1897, No. 3 spring; November, 1897–June, 1898, No. 3 spring, hard varieties; July, 1898–June, 1904, No. 1 spring; from February, 1897 "free on board" was used when available; July, 1904–December, 1918, Bartel's Red Book, average of daily ranges, quoted as No. 1 northern. Subsequently from the Chicago Daily Trade Bulletin and are averages of the daily cash price per bushel weighted by car-lot sales.

[3] Prices, 1839–1898, are from the Price Current Grain Reporter 1924 Yearbook, p. 4, and are average cash prices for calendar years; subsequently from the Chicago Daily Trade Bulletin and are averages of the daily cash price per bushel weighted by car-lot sales.

[4] 1849, 1859, 1866–1917, compiled from Commerce and Navigation of the United States; 1918, Foreign Commerce and Navigation of the United States; 1919–1926, Monthly Summary of Foreign Commerce of the United States, June issues, and January and June issues, 1927. Wheat flour converted to terms of grain on the following basis: 1849, 1859, 1866–1879, 1 barrel is the product of 5 bushels of grain; 1880–1908, 4.75; 1909–1917, 4.7; 1918–1919, 4.5; 1920, 4.6 bushels of grain; and 1921–1927, 1 barrel is the product of 4.7 bushels of grain. Bread and biscuit, when the quantity has been stated in kegs and boxes in the original returns, they have been converted to barrels on the basis of 3 kegs or 4 boxes to 1 barrel and 3½ kegs and boxes combined to 1 barrel.

[5] Includes flour milled from imported wheat.

[6] Total exports (domestic plus foreign) minus total imports.

[7] Imports of flour estimated.

TABLE 1.—*Wheat: Acreage, production, value, exports, etc., United States, 1849, 1859, 1866–1927*—Continued

Year	Acreage harvested	Average yield per acre	Production	Price per bushel received by producers Dec. 1	Farm value Dec. 1	Value per acre	Spring wheat, price per bushel at Chicago, year beginning July 1	No. 2 red winter wheat, price per bushel at Chicago, year beginning July 1	Foreign trade, including flour, year beginning July 1			
									Domestic exports	Imports	Net exports	
											Total	Percentage of production
	1,000 acres	*Bus.*	*1,000 bus.*	*Cts.*	*1,000 dolls.*	*Dolls.*	*Cts.*	*Cts.*	*1,000 bus.*	*1,000 bus.*	*1,000 bus.*	*Per cent*
1892	39,552	13.3	527,987	62.2	328,331	8.30	73	78	196,068	968	195,672	37.1
1893	37,934	11.3	427,553	53.5	228,599	6.03	60	68	168,498	1,183	167,531	39.2
1894	39,425	13.1	516,485	48.9	252,709	6.41	57	57	148,630	1,439	147,740	28.6
1895	40,848	13.9	569,456	50.3	286,539	7.01	61	62	130,099	2,117	130,345	22.9
1896	43,916	12.4	544,193	71.7	390,346	8.89	70	67	148,767	1,545	148,725	27.3
1897	46,046	13.3	610,254	80.9	493,683	10.72	91	86	221,143	2,060	220,965	36.2
1898	51,007	15.1	772,163	58.2	449,022	8.80	71	90	227,240	1,875	227,300	29.4
1899	*52,589*	*12.5*	*658,534*									
1899	52,589	12.1	636,051	58.6	372,982	7.09	70	[8] 72	190,772	320	190,749	30.0
1900	51,387	11.7	602,708	62.0	373,578	7.27	75	76	220,653	603	220,723	36.6
1901	52,473	15.0	788,638	62.6	493,766	9.41	74	72	239,212	121	239,137	30.3
1902	49,649	14.6	724,808	63.0	456,851	9.20	77	75	207,835	1,080	208,016	28.7
1903	51,632	12.9	663,923	69.5	461,439	8.94	90	83	124,977	229	124,926	18.8
1904	47,825	12.5	596,911	92.4	551,788	11.54	114	[9] 100	46,319	3,296	43,612	7.3
1905	49,389	14.7	726,819	74.6	542,543	10.90	89	[8] 88	101,089	273	100,849	13.9
1906	47,800	15.8	756,775	66.2	501,316	10.49	84	77	150,597	602	150,594	19.9
1907	45,116	14.1	637,981	86.5	552,074	12.24	107	90	166,525	530	166,304	26.1
1908	45,970	14.0	644,656	92.2	594,128	12.92	116	96	116,373	475	115,901	18.0
1909	*44,263*	*15.4*	*683,379*									
1909	44,262	15.8	700,434	98.4	689,108	15.57	114	110	89,173	845	88,465	12.6
1910	45,681	13.9	635,121	88.3	561,051	12.28	107	102	71,338	1,175	70,164	11.0
1911	49,543	12.5	621,338	87.4	543,063	10.96	110	90	81,891	3,445	78,447	12.6
1912	45,814	15.9	730,267	76.0	555,280	12.12	94	103	145,159	1,304	143,938	19.7
1913	50,184	15.2	763,380	79.9	610,122	12.16	93	88	147,955	2,402	146,306	19.2
1914	53,541	16.6	891,017	98.6	878,680	16.41	132	108	335,702	728	335,162	37.6
1915	60,469	17.0	1,025,801	91.9	942,303	15.58	120	113	246,221	7,254	239,591	23.4
1916	52,316	12.2	636,318	160.3	1,019,968	19.50	196	168	205,962	24,960	181,067	28.5
1917	45,089	14.1	636,655	200.8	1,278,112	28.35	227	225	132,579	31,215	102,775	16.1
1918	59,181	15.6	921,438	204.2	1,881,826	31.80	234	222	287,402	11,289	276,615	30.0
1919	*73,099*	*12.9*	*945,403*									
1919	75,694	12.8	967,979	214.9	2,080,056	27.48	276	224	222,030	5,511	216,671	22.4
1920	61,143	13.6	833,027	143.7	1,197,263	19.58	198	223	369,313	57,682	312,625	37.5
1921	63,696	12.8	814,905	92.6	754,834	11.85	136	125	282,566	17,375	265,590	32.6
1922	62,317	13.9	867,598	100.7	873,412	14.02	122	114	224,900	20,031	205,079	23.6
1923	59,659	13.4	797,394	92.3	736,006	12.34	119	102	159,880	28,079	131,892	16.5
1924	*50,862*	*15.7*	*800,877*									
1924	52,535	16.5	864,428	129.9	1,123,086	21.38	155	158	260,803	6,201	254,695	29.5
1925	52,255	12.9	676,429	141.6	957,907	18.33	166	164	108,035	15,679	92,669	13.7
1926	56,337	14.8	831,040	119.8	995,954	17.68	140	138	219,160	13,264	205,994	24.8
1927 [10]	58,583	14.9	871,691	111.8	974,594	16.64						

Bureau of Agricultural Economics. Production figures are estimates of the crop-reporting board; italic figures are census returns.

[8] Weighted average for 11 months. [9] Weighted average for 10 months. [10] Preliminary.

TABLE 2.—*Wheat: Acreage and production, by States, average 1921–1925, annual 1925–1927*

State	Acreage				Production			
	Average, 1921–1925	1925	1926	1927 [1]	Average, 1921–1925	1925	1926	1927 [1]
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
Maine	6	7	6	4	143	196	120	72
Vermont	4	2	2	1	71	42	40	20
New York	395	308	279	301	7, 675	5, 998	4, 887	6, 291
New Jersey	68	56	60	60	1, 347	1, 176	1, 320	1, 380
Pennsylvania	1, 250	1, 125	1, 177	1, 098	22, 831	22, 500	23, 533	20, 301
Ohio	2, 157	1, 616	1, 795	1, 615	33, 218	24, 304	40, 384	29, 068
Indiana	1, 913	1, 772	1, 703	1, 790	28, 408	25, 700	34, 048	27, 749
Illinois	2, 847	2, 290	2, 283	2, 509	47, 926	36, 880	41, 034	34, 844
Michigan	928	856	984	897	16, 086	14, 557	17, 998	19, 270
Wisconsin	148	113	128	145	2, 568	2, 267	2, 599	3, 142
Minnesota	2, 036	2, 263	1, 929	1, 808	28, 346	30, 269	24, 811	21, 397
Iowa	571	388	378	466	11, 080	6, 303	8, 078	8, 711
Missouri	2, 490	1, 704	1, 403	1, 568	30, 893	22, 515	21, 474	15, 700
North Dakota	9, 247	9, 605	9, 653	9, 846	104, 921	112, 378	77, 081	124, 970
South Dakota	2, 763	2. 701	1, 917	3, 092	32, 100	31, 835	11, 611	46. 193
Nebraska	3, 411	2, 676	3, 077	3, 630	48, 754	34, 150	40, 085	73, 826
Kansas	9, 405	8, 601	10, 147	9, 946	114, 542	77, 388	150, 084	111, 327
Delaware	106	102	103	98	1, 728	1, 887	2, 060	1, 862
Maryland	553	495	520	525	9, 522	10, 395	11, 960	9, 188
Virginia	755	630	687	687	9, 442	8, 946	11, 336	8, 381
West Virginia	195	134	147	135	2, 449	1, 809	2, 352	1, 796
North Carolina	513	406	447	483	5, 074	4, 466	6, 303	5, 168
South Carolina	112	46	50	80	1, 135	506	800	880
Georgia	138	99	104	125	1, 294	1, 040	1, 560	1, 150
Kentucky	467	230	258	322	5, 357	3, 220	4, 773	3, 059
Tennessee	408	367	440	528	4, 269	4, 588	7, 920	3, 696
Alabama	14	7	7	7	143	77	94	74
Mississippi	5	5	4	6	71	90	68	102
Arkansas	63	30	30	28	702	390	405	322
Oklahoma	3, 507	3, 316	4, 214	3, 708	40, 552	27, 191	73, 745	33, 372
Texas	1, 415	819	1, 802	1, 850	15, 795	6, 552	32, 796	17, 945
Montana	3, 204	3, 250	3, 570	3, 827	44, 134	35, 021	44, 744	79, 702
Idaho	1, 010	926	1, 045	1, 171	24, 689	26, 042	24, 633	32, 374
Wyoming	169	155	198	226	2, 694	2, 720	3, 714	4, 412
Colorado	1, 452	1, 156	1, 463	1, 564	19, 492	14, 652	18, 452	21, 997
New Mexico	147	80	249	55	1, 763	492	5, 653	570
Arizona	39	32	38	58	923	736	950	1, 450
Utah	255	233	237	242	5, 591	6, 094	5, 505	5, 678
Nevada	18	15	17	19	464	456	408	484
Washington	2, 281	2, 072	2, 107	2, 186	43, 639	40, 251	40, 901	53, 344
Oregon	1, 028	964	1, 026	1, 065	20, 931	18, 893	18, 706	26, 782
California	599	603	653	812	11, 386	11, 457	12, 015	13, 642
United States	58, 092	52, 255	56, 337	58, 583	804, 151	676, 429	831, 040	871, 691

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

[1] Preliminary.

Table 3.—*Wheat, winter and spring: Acreage and production, by States, average 1921–1925, annual 1925–1927*

WINTER

State	Acreage				Production			
	Average, 1921–1925	1925	1926	1927 [1]	Average, 1921–1925	1925	1926	1927 [1]
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
New York	380	300	270	289	7, 436	5, 850	4, 725	6, 069
New Jersey	68	56	60	60	1, 347	1, 176	1, 320	1, 380
Pennsylvania	1, 242	1, 125	1, 170	1, 090	22, 710	22, 500	23, 400	20, 165
Ohio	2, 144	1, 612	1, 789	1, 610	33, 021	24, 180	40, 252	28, 980
Indiana	1, 909	1, 768	1, 697	1, 782	28, 350	25, 636	33, 940	27, 621
Illinois	2, 735	2, 230	2, 163	2, 293	46. 127	35, 680	38, 934	30, 956
Michigan	915	851	979	891	15, 928	14, 467	17, 916	19, 156
Wisconsin	76	53	65	73	1, 453	1, 007	1, 339	1, 716
Minnesota	121	170	146	155	2, 181	3, 060	2, 555	3, 317
Iowa	525	358	342	425	10, 477	5, 871	7, 524	8, 075
Missouri	2, 484	1, 696	1, 391	1, 558	30, 804	22, 387	21, 282	15, 580
South Dakota	101	125	75	105	1, 418	1, 438	638	1, 890
Nebraska	3, 177	2, 493	2, 881	3. 457	46, 097	31, 661	37, 165	70, 868
Kansas	9, 393	8, 592	10, 139	9, 936	114, 435	77, 328	150, 057	111, 283
Delaware	106	102	103	98	1, 728	1, 887	2, 060	1, 862
Maryland	553	495	520	525	9, 522	10, 395	11, 960	9, 188
Virginia	755	630	687	687	9, 442	8, 946	11, 336	8, 381
West Virginia	195	134	147	135	2, 449	1, 809	2, 352	1, 796
North Carolina	513	406	447	483	5, 074	4, 466	6, 303	5, 168
South Carolina	112	46	50	80	1, 135	506	800	880
Georgia	138	99	104	125	1, 291	1, 040	1, 560	1, 150
Kentucky	467	230	258	322	5, 357	3, 220	4, 773	3, 059
Tennessee	408	367	440	528	4, 269	4, 588	7, 920	3, 696
Alabama	14	7	7	7	143	77	94	74
Mississippi	5	5	4	6	71	90	68	102
Arkansas	63	30	30	28	702	390	405	322
Oklahoma	3, 507	3, 316	4, 214	3, 708	40, 552	27, 191	73, 745	33, 372
Texas	1, 415	819	1, 802	1, 850	15, 795	6, 552	32, 796	17, 945
Montana	532	224	521	625	8, 416	3, 248	7, 294	13, 750
Idaho	419	406	447	501	9, 607	10, 962	10, 281	12, 274
Wyoming	26	35	48	54	419	560	864	972
Colorado	1, 137	896	1, 207	1, 231	14. 342	10, 752	14, 484	16, 003
New Mexico	99	52	212	25	1, 094	156	4, 876	150
Arizona	39	32	38	58	923	736	950	1, 450
Utah	147	145	149	152	2, 623	3, 190	3, 129	2, 888
Nevada	3	4	5	5	75	104	120	120
Washington	1, 179	372	847	1, 203	26, 545	9, 821	19, 481	33, 684
Oregon	735	350	880	900	15, 843	7, 350	16, 720	23, 400
California	599	603	653	812	11, 386	11, 457	12, 015	13, 642
United States	38, 434	31, 234	36, 987	37, 872	550, 593	401, 734	627, 433	552, 384

SPRING [2]

State	Acreage: Average, 1921–1925	Acreage: 1925	Acreage: 1926	Acreage: 1927 [1]	Production: Average, 1921–1925	Production: 1925	Production: 1926	Production: 1927 [1]
Maine	6	7	6	4	143	196	120	72
Vermont	4	2	2	1	71	42	40	20
New York	15	8	9	12	239	148	162	222
Pennsylvania	[3] 13		7	8	[3] 202		133	136
Ohio	12	4	6	5	197	124	132	88
Indiana	4	4	6	8	58	64	108	128
Illinois	112	60	120	216	1, 799	1, 200	2, 100	3, 888
Michigan	13	5	5	6	158	90	82	114
Wisconsin	72	60	63	72	1, 115	1, 260	1, 260	1, 426
Minnesota	1, 915	2, 093	1, 783	1, 653	26, 165	27, 209	22, 256	18, 080
Iowa	47	30	36	41	603	432	554	636
Missouri	6	8	12	10	88	128	192	120
North Dakota	9, 247	9, 605	9, 653	9, 846	104, 921	112, 378	77, 081	124, 970
South Dakota	2, 062	2, 576	1, 842	2, 987	30, 682	30, 397	10, 973	44, 303
Nebraska	234	183	196	173	2, 657	2, 489	2, 920	2, 958
Kansas	13	9	8	10	107	60	27	44
Montana	2, 672	3, 026	3, 049	3, 202	35, 718	31, 773	37, 450	65, 952
Idaho	592	520	598	670	15, 082	15, 080	14, 352	20, 100
Wyoming	143	120	150	172	2, 274	2, 160	2, 850	3, 440
Colorado	316	260	256	333	5, 150	3, 900	3, 968	5, 994
New Mexico	48	28	37	30	669	336	777	420
Utah	108	88	88	90	2, 968	2, 904	2, 376	2, 790
Nevada	15	11	12	14	389	352	288	364
Washington	1, 102	1, 700	1, 260	983	17, 094	30, 430	21, 420	19, 660
Oregon	293	614	146	165	5, 089	11, 543	1, 986	3, 382
United States	19, 658	21, 021	19, 350	20, 711	253, 558	274, 695	203, 607	319, 307

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

[1] Preliminary. [2] Including durum. [3] Three-year average.

Table 4.—*Wheat: Yield per acre and estimated price per bushel, December 1, States, average 1914–1920, 1921–1925, annual 1923–1927*

State	Yield per acre							Estimated price per bushel						
	Av., 1914–1920	Av., 1921–1925	1923	1924	1925	1926	1927	Av., 1914–1920	Av., 1921–1925	1923	1924	1925	1926	1927
	Bush.	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
Maine	22.7	24.4	26.0	26.0	28.0	20.0	18.0	190	161	118	170	170	175	175
Vermont	23.0	19.6	21.0	21.0	21.0	20.0	20.0	181	142	140	152	150	132	140
New York	21.5	19.4	20.2	18.7	19.5	17.5	20.9	170	126	110	144	152	132	125
New Jersey	18.3	19.7	20.0	18.5	21.0	22.0	23.0	176	127	110	157	143	132	125
Pennsylvania	17.7	18.3	19.0	16.5	20.0	20.0	18.5	168	121	100	144	147	129	127
Ohio	18.0	15.5	18.2	18.0	15.0	22.5	18.0	167	125	99	145	158	127	125
Indiana	16.1	14.9	16.5	17.0	14.5	20.0	15.5	166	123	98	142	155	124	124
Illinois	17.4	16.7	18.0	16.1	16.1	18.0	13.9	164	117	94	136	150	122	120
Michigan	17.8	17.5	17.0	24.0	17.0	18.3	21.5	166	122	96	138	156	122	120
Wisconsin	19.2	18.2	16.6	24.0	20.1	20.3	21.7	162	112	98	128	136	126	117
Minnesota	13.3	14.3	12.7	22.1	13.4	12.9	11.8	163	112	95	130	137	123	110
Iowa	18.0	19.1	18.5	20.2	16.2	21.4	18.7	154	108	89	127	136	120	117
Missouri	13.8	12.6	13.0	13.3	13.2	15.3	10.0	161	117	97	133	150	124	122
North Dakota	10.3	11.5	7.4	15.7	11.7	8.0	12.7	159	104	86	126	131	117	104
South Dakota	11.9	11.7	9.6	14.6	11.8	6.1	14.9	154	103	81	125	128	118	106
Nebraska	16.0	14.2	9.9	19.1	12.8	13.0	20.3	152	105	83	122	140	117	109
Kansas	14.4	12.0	10.1	16.3	9.0	14.8	11.2	156	112	91	128	148	119	117
Delaware	15.6	16.4	18.0	17.8	18.5	20.0	19.0	171	119	100	144	145	130	125
Maryland	16.7	17.3	19.2	15.8	21.0	23.0	17.5	170	122	100	145	151	130	127
Virginia	12.9	12.6	13.3	13.4	14.2	16.5	12.2	174	131	110	148	161	131	132
West Virginia	14.1	12.7	13.0	13.0	13.5	16.0	13.3	175	132	116	147	158	135	137
North Carolina	10.0	10.1	11.1	12.0	11.0	14.1	10.7	189	148	128	160	171	143	145
South Carolina	10.8	10.4	11.0	11.0	11.0	16.0	11.0	219	175	154	170	185	155	152
Georgia	10.5	9.5	9.2	9.5	10.5	15.0	9.2	215	165	147	169	182	150	155
Kentucky	11.9	11.6	12.4	10.3	14.0	18.5	9.5	172	129	108	143	160	133	135
Tennessee	10.5	10.5	10.2	10.5	12.5	18.0	7.0	176	134	115	147	166	136	139
Alabama	10.3	10.5	10.0	10.0	11.0	13.4	10.6	204	156	130	162	175	160	155
Mississippi	14.8	14.3	15.0	12.4	18.0	17.0	17.0	203	139	110	150	160	129	135
Arkansas	11.5	11.6	11.0	11.5	13.0	13.5	11.5	166	119	108	133	150	128	125
Oklahoma	13.5	11.4	11.0	16.0	8.2	17.5	9.0	155	110	93	124	147	118	120
Texas	13.0	11.0	10.5	18.5	8.0	18.2	9.7	168	119	103	129	155	120	121
Montana	14.6	13.7	14.6	16.4	10.8	12.5	20.8	154	104	82	124	139	112	96
Idaho	22.9	24.3	28.6	19.4	28.1	23.6	27.6	145	120	80	131	125	106	98
Wyoming	21.7	16.0	15.9	15.2	17.5	18.8	19.5	150	95	80	111	124	107	94
Colorado	19.2	13.4	13.0	14.4	12.7	12.6	14.1	149	100	83	118	136	107	104
New Mexico	18.8	10.9	12.0	14.2	6.2	22.7	10.4	156	122	108	125	150	110	119
Arizona	21.4	23.4	26.0	21.0	23.0	25.0	25.0	190	139	140	141	175	130	135
Utah	20.9	21.8	24.1	10.5	20.2	23.2	23.5	150	103	91	130	130	105	102
Nevada	26.4	25.6	25.4	22.6	30.4	24.0	25.5	159	132	115	150	146	116	125
Washington	19.4	18.9	25.0	14.3	19.4	19.4	24.4	152	107	85	130	130	116	108
Oregon	19.3	20.2	24.1	16.5	19.6	18.2	25.1	151	89	88	129	136	120	112
California	16.2	18.4	21.6	15.0	19.0	18.4	16.8	164	126	108	154	148	130	118
United States	14.6	13.9	13.4	16.5	12.9	14.8	14.9	159.2	111.4	92.3	129.9	141.6	119.8	111.8

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

TABLE 5.—*Winter and spring wheat: Acreage sown and harvested, production, and farm value, United States, 1910–1927*

Year	Winter wheat						Spring wheat				
	Acreage sown in preceding fall	Acreage harvested	Average yield per acre	Production	Price per bushel received by producers Dec. 1	Total farm value Dec. 1	Acreage harvested	Average yield per acre	Production	Price per bushel received by producers Dec. 1	Total farm value Dec. 1
	1,000 acres	*1,000 acres*	*Bush.*	*1,000 bushels*	*Cents*	*1,000 dollars*	*1,000 acres*	*Bush.*	*1,000 bushels*	*Cents*	*1,000 dollars*
1910	31, 659	27, 329	15. 9	434, 142	88. 1	382, 318	18, 352	11. 0	200, 979	88. 9	178, 733
1911	32, 648	29, 162	14. 8	430, 656	88. 0	379, 151	20, 381	9. 4	190, 682	86. 0	163, 912
1912	33, 229	26, 571	15. 1	399, 919	80. 9	323, 572	19, 243	17. 2	330, 348	70. 1	231, 708
1913	33, 274	31, 699	16. 5	523, 561	82. 9	433, 995	18, 485	13. 0	239, 819	73. 4	176, 127
1914	37, 158	36, 008	19. 0	684, 990	98. 6	675, 623	17, 533	11. 8	206, 027	98. 6	203, 057
1915	42, 431	41, 308	16. 3	673, 947	94. 7	638, 149	19, 161	18. 4	351, 854	86. 4	304, 154
1916	39, 245	34, 709	13. 8	480, 553	162. 7	781, 906	17, 607	8. 8	155, 765	152. 8	238, 062
1917	38, 359	27, 257	15. 1	412, 901	202. 8	837, 237	17, 832	12. 5	223, 754	197. 0	440, 875
1918	43, 126	37, 130	15. 2	565, 099	206. 3	1, 165, 995	22, 051	16. 2	356, 339	200. 9	715, 831
1919	51, 483	50, 494	15. 1	760, 377	210. 5	1, 600, 805	25, 200	8. 2	207, 602	230. 9	479, 251
1920	44, 861	40, 016	15. 3	610, 597	148. 6	907, 291	21, 127	10. 5	222, 430	130. 4	289, 972
1921	45, 625	43, 414	13. 8	600, 316	95. 1	571, 044	20, 282	10. 6	214, 589	85. 6	183, 790
1922	47, 930	42, 358	13. 8	586, 878	104. 7	614, 399	19, 959	14. 1	280, 720	92. 3	259, 013
1923	46, 091	39, 508	14. 5	571, 777	95. 1	543, 530	20, 151	11. 2	225, 617	85. 3	192, 476
1924	38, 916	35, 656	16. 6	592, 259	131. 6	779, 548	16, 879	16. 1	272, 169	126. 2	343, 538
1925	39, 848	31, 234	12. 9	401, 734	147. 9	594, 289	21, 021	13. 1	274, 695	132. 4	363, 618
1926	39, 887	36, 987	17. 0	627, 433	121. 2	760, 406	19, 350	10. 5	203, 607	115. 7	235, 548
1927 [1]	43, 465	37, 872	14. 6	552, 384	116. 8	645, 091	20, 711	15. 4	319, 307	103. 2	329, 603

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[1] Preliminary.

TABLE 6.—*Durum wheat:*[1] *Acreage harvested, yield per acre, and production, by States, 1917–1927*

State and items	Year										
	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927 [2]
Minnesota:											
Acreage harvested..1,000 acres..	100	123	125	115	147	248	225	126	146	191	268
Average yield per acre...bush..	15. 5	20. 0	11. 9	12. 0	11. 9	16. 0	12. 7	21. 5	15. 2	14. 0	13. 2
Production..........1,000 bush..	1, 557	2, 460	1, 485	1, 383	1, 754	3, 960	2, 858	2, 709	2, 219	2, 674	3, 538
North Dakota:											
Acreage harvested..1,000 acres..	1, 574	2, 204	2, 749	3, 210	3, 788	4, 026	3, 667	2, 757	3, 170	3, 804	3, 994
Average yield per acre...bush..	9. 0	14. 0	7. 9	10. 5	9. 7	15. 0	9. 1	16. 3	14. 6	9. 5	14. 0
Production..........1,000 bush..	14, 168	30, 856	21, 720	33, 702	36, 741	60, 397	33, 370	44, 939	46, 282	36, 138	55, 916
South Dakota:											
Acreage harvested..1,000 acres..	573	636	699	716	961	1, 239	1, 275	865	900	765	994
Average yield per acre...bush..	15. 6	19. 5	9. 8	12. 4	11. 0	15. 5	12. 0	15. 4	13. 9	6. 6	16. 5
Production..........1,000 bush..	8, 941	12, 403	6, 848	8, 884	10, 570	19, 206	15, 300	13, 321	12, 510	5, 049	16, 401
Montana:											
Acreage harvested..1,000 acres..	149	350	209	368	380	279	128	78	64	14	15
Average yield per acre...bush..	9. 0	12. 9	4. 5	11. 5	11. 2	14. 7	10. 2	18. 0	10. 0	8. 6	20. 0
Production..........1,000 bush..	1, 343	4, 516	943	4, 231	4, 259	4, 106	1, 306	1, 404	640	120	300
Total, 4 States:											
Acreage harvested..1,000 acres..	2, 397	3, 313	3, 782	4, 409	5, 276	5, 792	5, 295	3, 826	4, 280	4, 774	5, 271
Average yield per acre...bush..	10. 9	15. 2	8. 2	10. 9	10. 1	15. 1	10. 0	16. 3	14. 4	9. 2	14. 4
Production..........1,000 bush..	26, 009	50, 235	30, 996	48, 200	53, 324	87, 669	52, 834	62, 373	61, 651	43, 981	76, 155

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[1] Included in spring wheat in Table 3. [2] Preliminary.

TABLE 7.—*Wheat: Condition on 1st of month, 1909–1927*

Year	Winter wheat					Spring wheat				All wheat	
	Dec. 1 previous	Apr. 1	May 1	June 1	July 1	June 1	July 1	Aug. 1	Sept. 1	June 1	July 1
	P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
1909	85.3	82.2	83.5	80.7	82.4	95.2	92.7	91.6	88.6	86.5	86.5
1910	95.8	80.8	82.1	80.0	81.5	92.8	61.6	61.0	63.1	85.2	73.5
1911	82.5	83.3	86.1	80.4	76.8	94.6	73.8	59.8	56.7	85.4	75.7
1912	86.6	80.6	79.7	74.3	73.3	95.8	89.3	90.4	90.8	83.5	80.1
1913	93.2	91.6	91.9	83.5	81.6	93.5	73.8	74.1	75.3	87.2	78.6
1914	97.2	95.6	96.0	92.7	94.1	95.5	92.1	75.5	68.0	93.6	93.5
1915	88.3	88.8	92.9	85.8	84.4	94.9	93.3	93.4	94.6	88.2	87.0
1916	87.7	78.3	82.4	73.2	75.7	88.2	89.0	63.4	48.6	77.7	79.9
1917	85.7	63.4	73.2	70.9	75.9	91.6	83.6	68.7	71.2	78.5	78.9
1918	79.3	78.6	86.4	83.8	79.5	95.2	86.1	79.6	82.1	87.7	81.9
1919	98.5	99.8	100.5	94.9	89.0	91.2	80.9	53.9	48.5	93.8	86.6
1920	85.2	75.6	79.1	78.2	79.7	89.1	88.0	73.4	64.1	81.7	82.5
1921	87.9	91.0	88.8	77.9	77.2	93.4	80.8	66.6	62.5	82.0	78.2
1922	76.0	78.4	83.5	81.9	77.0	90.7	83.7	80.4	80.1	84.3	78.9
1923	79.5	75.2	80.1	76.3	76.8	90.2	82.4	69.6	65.1	79.9	78.3
1924	88.0	83.0	84.8	74.0	77.9	82.3	81.9	79.7	82.3	76.0	79.0
1925	81.0	68.7	77.0	66.5	65.9	87.1	88.1	73.9	75.0	73.2	73.4
1926	82.6	84.1	84.0	76.5	77.4	78.5	64.8	60.2	58.4	77.0	73.6
1927	81.8	84.5	85.6	72.2	75.0	86.8	89.7	86.4	82.7	76.1	79.2

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TABLE 8.—*Winter wheat: Percentage of acreage abandoned, average 1914–1920, 1921–1925, annual 1924–1927* [1]

State	Av., 1914–1920	Av., 1921–1925	1924	1925	1926	1927	State	Av., 1914–1920	Av., 1921–1925	1924	1925	1926	1927
	P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*		*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*
N. Y.	3.5	2.8	3.8	2.5	8.0	1.0	Ky.	6.6	11.0	32.0	13.0	2.5	3.0
N. J.	4.9	2.8	4.0	2.0	3.0	1.0	Tenn.	8.8	5.7	14.0	6.0	1.7	5.0
Pa.	3.2	2.1	3.0	2.0	2.0	2.5	Ala.	8.1	10.4	26.0	6.0	3.0	10.0
Ohio	6.0	9.9	10.0	23.0	3.0	3.0	Miss.	10.9	26.4	50.0	40.0	20.0	10.0
Ind.	9.8	6.1	7.0	10.4	3.0	3.0	Ark.	3.3	5.3	5.0	10.0	3.0	20.0
Ill.	13.0	5.8	13.0	3.0	5.0	5.5	Okla.	8.4	10.6	4.0	20.0	2.0	20.0
Mich.	5.7	2.5	2.0	1.5	7.0	2.0	Tex.	17.4	20.2	5.0	54.0	3.0	24.0
Wis.	12.0	12.2	3.0	30.0	10.0	2.5	Mont.	20.9	28.2	10.0	70.0	20.0	12.0
Minn.	11.9	9.8	5.0	16.0	7.0	2.0	Idaho	5.4	7.5	11.0	15.0	6.0	4.0
Iowa	14.6	4.0	3.0	9.0	4.0	2.5	Wyo.	7.1	12.0	10.0	15.0	4.0	12.0
Mo.	7.8	4.6	11.0	4.0	5.5	11.0	Colo.	9.1	22.7	10.0	33.0	20.0	25.0
S. Dak.	13.9	17.7	10.0	25.0	20.0	10.0	N. Mex.	14.4	42.0	10.2	80.0	3.0	89.0
Nebr.	14.6	11.2	5.0	19.0	12.0	4.0	Ariz.	7.2	6.6	2.0	3.0	2.0	1.0
Kans.	15.3	16.1	4.0	20.0	11.0	20.0	Utah.	3.7	3.1	5.0	2.0	2.0	3.0
Del.	3.6	2.9	5.0	1.5	2.0	1.0	Nev.	4.9	3.0	2.0	2.0	0	0
Md.	3.1	2.5	4.0	1.5	1.5	1.5	Wash.	12.8	21.8	25.0	70.0	4.0	6.0
Va.	2.5	2.7	5.2	2.0	1.5	2.0	Oreg.	3.4	16.2	8.0	65.0	3.0	1.0
W. Va.	2.1	4.9	8.0	10.0	1.0	1.5	Calif.	13.0	24.6	54.0	25.0	7.0	3.0
N. C.	3.3	2.4	5.0	1.5	2.0	3.0							
S. C.	5.8	4.7	5.0	4.0	2.5	6.0	U. S.	10.4	12.1	8.4	21.6	7.3	12.9
Ga.	10.3	12.9	42.0	5.0	3.0	8.0							

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[1] For entire season, planting to harvest. Includes winter abandonment, which is estimated on May 1 of each season.

TABLE 9.—*Wheat: Acreage, yield per acre, and production in specified countries, average 1909–1913, annual 1924–1927*

Country	Acreage					Yield per acre					Production				
	Average, 1909–1913 [1]	1924	1925	1926	1927, preliminary	Average, 1909–1913 [1]	1924	1925	1926	1927, preliminary	Average, 1909–1913 [1]	1924	1925	1926	1927, preliminary
NORTHERN HEMISPHERE															
NORTH AMERICA	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
Canada	9, 945	22, 056	21, 973	22, 896	22, 460	19. 8	11. 9	18. 7	17. 9	19. 8	197, 119	262, 097	411, 376	409, 811	444, 282
United States	47, 097	52, 535	52, 255	56, 337	58, 583	14. 7	16. 5	12 9	14. 8	14. 9	690, 108	864, 428	676, 429	831, 040	871, 691
Mexico	[2] 2, 174	1, 404	1, 161	1, 286	1, 228	5. 3	7. 4	8. 1	8. 0	9. 4	[3] 11, 481	10, 357	9, 440	10, 333	11, 519
Guatemala		33	22	25	24		6. 9	6. 8	8. 0	9. 2		228	150	200	220
Total countries reporting all years shown	59, 216	75, 995	75, 389	80, 519	82, 271	15. 2	15. 0	14. 6	15. 5	16. 1	898, 708	1, 136, 882	1, 097, 245	1, 251, 184	1, 327, 492
EUROPE															
United Kingdom:															
England and Wales	1, 787	1, 545	1, 500	1, 592	1, 636	31. 2	32. 9	33. 8	30. 6	32. 5	55, 770	50, 885	50, 773	48, 683	53, 116
Scotland	57	49	49	54	67	39. 9	37. 3	41. 1	38. 7	36. 2	2, 273	1, 829	2, 016	2, 091	2, 427
Ireland	43	38	26	35	40	37. 1	31. 4	33. 8	39. 5		1, 597	1, 192	880	1, 381	
Norway	12	21	22	22	22	25. 5	23. 5	22. 3	26. 6	25. 6	306	493	490	586	563
Sweden	255	322	363	381	404	31. 8	21. 1	36. 8	32. 4	27. 9	8, 103	6, 800	13, 359	12, 363	11, 287
Denmark	154	149	198	252		41. 1	39. 4	49. 2	34. 8		6, 322	5, 864	9, 748	8, 767	9, 553
Netherlands	138	118	132	132	150	36. 1	39. 9	43. 5	41. 6	34. 0	4, 976	4, 706	5, 743	5, 487	5, 096
Belgium	404	340	365	351	389	37. 6	38. 3	39. 7	36. 2	37. 1	15, 199	13, 007	14, 477	12, 801	14, 449
Luxemburg	27	22	27	32	36	22. 8	14. 2	20. 5	19. 4	20. 6	615	312	553	622	743
France	16, 500	13, 620	13, 872	12, 971	13, 208	19. 7	20. 6	23. 8	17. 9	21. 5	325, 644	281, 179	330, 340	231, 767	284, 356
Spain	9, 547	10, 379	10, 722	10, 775	10, 671	13. 7	11. 7	15. 2	13. 6	13. 7	130, 446	121, 778	162, 591	146, 600	146, 439
Portugal	[4] 1, 211	945		1, 042		[5] 9. 8	9. 1		8. 2		[5] 11, 850	8, 577	12, 090	8, 557	11, 280
Italy	11, 793	11, 283	11, 672	12, 145	12, 320	15. 6	15. 1	20. 6	18. 2	15. 9	184, 393	170, 144	240, 844	220, 642	195, 808
Switzerland	105	104	105	127	174	31. 6	29. 9	33. 5	31. 7	24. 9	3, 314	3, 112	3, 516	4, 027	4, 336
Germany	4, 029	3, 623	3, 835	3, 956	4, 320	32. 6	24. 6	30. 8	24. 1	27. 9	131, 274	89, 199	118, 213	95, 429	120, 518
Austria	635	482	484	500	497	20. 2	17. 6	22. 0	18. 9	20. 8	12, 813	8, 490	10, 671	9, 438	10, 360
Czechoslovakia	1, 718	1, 497	1, 526	1, 541	1, 586	22. 0	21. 5	25. 8	22. 1	23. 9	37, 879	32, 238	39, 309	34, 130	37, 870
Hungary	3, 712	3, 499	3, 524	3, 706	3, 906	19. 3	14. 7	20. 3	20. 2	19. 4	71, 493	51, 568	71, 675	74, 909	75, 835
Yugoslavia	3, 982	4, 244	4, 307	4, 178	4, 622	15. 6	13. 6	18. 3	17. 1	12. 2	62, 024	57, 770	78, 646	71, 428	56, 527

[1] Where changes in boundary have occurred, averages are estimates for territory within present boundaries.
[2] 2-year average.
[3] 4-year average.
[4] 3-year average.
[5] 1 year only.

Table 9.—*Wheat: Acreage, yield per acre, and production in specified countries, average 1909–1913, annual 1924–1927*—Continued

Country	Acreage					Yield per acre					Production				
	Average, 1909–1913	1924	1925	1926	1927, preliminary	Average, 1909–1913	1924	1925	1926	1927, preliminary	Average, 1909–1913	1924	1925	1926	1927, preliminary
NORTHERN HEMISPHERE—Continued															
EUROPE—continued	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
Greece	[5] 1,134	1,034	1,066	1,153	1,140	[5] 14.4	7.4	10.5	9.7	11.7	[5] 16,273	7,696	11,173	11,171	13,300
Bulgaria	2,409	2,492	2,546	2,587	2,659	15.7	9.9	16.2	15.9	17.8	37,823	24,698	41,359	41,064	47,346
Rumania	[3] 9,515	7,838	8,156	8,222	7,663	[3] 16.7	9.0	12.8	13.5	12.6	[3] 158,672	70,420	104,741	110,882	96,798
Poland	3,350	2,651	2,702	2,719	2,811	19.0	12.3	21.4	17.3	19.3	63,675	32,498	57,797	47,080	54,229
Lithuania	211	210	277	303	297	15.5	15.8	19.1	13.8	16.8	3,264	3,319	5,285	4,180	5,004
Latvia	85	106	119	122	145	17.4	14.9	18.2	15.2	18.2	1,475	1,582	2,165	1,860	2,646
Estonia	23	44	51	59	67	15.8	12.3	15.5	14.3	15.6	364	543	791	844	1,045
Finland	8	37	38	39	39	17.1	21.4	24.4	23.7	20.8	137	790	929	924	813
Russia, European	57,420	33,200	36,561			10.6	7.4	14.2			607,828	246,927	[6] 519,811	[6] 590,234	
Total European countries reporting all years shown	71,436	65,560	67,460	67,670	68,829	18.6	15.8	20.3	17.6	18.0	1,328,205	1,035,056	1,367,456	1,189,008	1,240,911
Estimated European total excluding Russia	72,800	66,700	68,800	69,000	70,200						[7] 1,348,000	1,051,000	1,390,000	1,208,000	1,262,000
AFRICA															
Morocco	(1,700)	2,461	2,621	2,558	2,273		11.6	9.1	6.3	10.9	(17,000)	28,660	23,883	16,174	24,802
Algeria	3,521	3,526	3,608	3,741	3,387	10.0	4.9	9.1	6.3	8.1	35,161	17,285	32,670	23,551	27,557
Tunis	1,310	1,214	1,625	1,838	1,038	4.8	4.3	7.2	7.1	8.0	6,224	5,181	11,758	13,044	8,267
Egypt	1,314	1,416	1,380	1,532	1,655	25.6	24.1	26.3	24.3	26.8	33,662	34,186	36,248	37,207	44,346
Total	7,845	8,617	9,234	9,669	8,353	11.7	9.9	11.3	9.3	12.6	92,047	85,312	104,559	89,976	104,972
ASIA															
Turkey		4,129	4,548	3,228				8.7					39,510		
Cyprus	162	190	183	191		13.7	9.7	11.4	8.5		2,216	1,851	2,079	1,624	
India	29,224	31,181	31,774	30,470	31,244	12.0	11.6	10.4	10.7	10.7	351,841	360,636	330,997	324,651	334,059
Russia, Asiatic	16,789	12,858	16,748			9.0	10.5	11.5			151,113	134,814	[6] 193,236	[6] 219,415	

Japanese Empire:															
Japan	1, 179	1, 149	1, 149	1, 146	1, 157	21. 8	21. 8	25. 7	24. 8	25. 3	25, 088	25, 060	29, 541	28, 430	29, 244
Chosen	574	384	887	895	897	12. 0	11. 6	11. 8	11. 8	11. 2	6, 898	10, 289	10, 509	10, 517	10, 007
Formosa	15	3	2	1		11. 3	7. 7	10. 5	13. 0		169	23	21	13	
Kwantung	4	4	4			[4] 10. 0	10. 0	8. 0			40	40	32		
Total Asiatic countries reporting all years shown	30, 977	33, 214	33, 810	32, 511	33, 298	12. 4	11. 9	11. 0	11. 2	11. 2	383, 827	395, 985	371, 047	363, 598	373, 310
Estimated Asiatic total, excluding Russia and China	37, 600	39, 500	40, 400	37, 700	38, 200						419, 060	456, 000	432, 000	431, 000	443, 000
Total Northern Hemisphere reporting all years shown	169, 474	183, 386	185, 893	190, 369	192, 751	15. 9	14. 5	15. 8	15. 2	15. 8	2, 702, 787	2, 653, 235	2, 940, 307	2, 893, 766	3, 046, 685
Estimated total, excluding Russia and China	177, 500	191, 000	193, 900	197, 100	199, 100						2, 759, 000	2, 731, 000	3, 026, 000	2, 981, 000	3, 136, 000
SOUTHERN HEMISPHERE															
Brazil		242	238	240			16. 1	17. 4	19. 1			3, 902	4, 145	4, 589	
Chile	1, 003	1, 429	1, 446	1, 502		29. 9	17. 1	18. 4	15. 5		20, 062	24, 470	26, 636	23, 286	
Uruguay	791	850	957	987	1, 039	8. 2	11. 7	10. 5	10. 4		[3] 6, 517	9, 908	10, 024	10, 234	
Argentina	16, 051	17, 792	19, 197	19, 275	19, 714	9. 2	10. 7	10. 0	11. 5	12. 1	147, 059	191, 138	191, 141	220, 827	238, 832
Union of South Africa	[5] 803	755	1, 058			[5] 7. 5	9. 4	7. 4			[5] 6, 034	7, 132	7, 844	9, 029	7, 765
Southern Rhodesia		3	5	5			6. 0	7. 6	7. 8			18	38	30	
Australia	7, 603	10, 825	10, 201	11, 063	11, 000	11. 9	15. 2	11. 2	14. 5	10. 0	90, 497	164, 559	114, 504	100, 858	110, 000
New Zealand	241	167	152	222		28. 7	32. 6	30. 4	35. 8		6, 925	5, 448	4, 617	7, 952	
Total Southern Hemisphere countries all years shown	23, 654	28, 617	29, 398	30, 338	30, 714	10. 0	12. 4	10. 4	12. 6	11. 4	237, 556	355, 697	305, 645	381, 085	348, 832
Estimated total	26, 700	32, 600	33, 800	33, 900	35, 400						282, 000	410, 000	363, 000	440, 000	407, 000
Total Northern and Southern Hemisphere countries reporting all years shown	193, 128	212, 003	215, 291	220, 707	223, 465	15. 2	14. 2	15. 1	14. 8	15. 2	2, 940, 343	3, 008, 932	3, 245, 952	3, 275, 451	3, 395, 517
Estimated world total, excluding Russia and China	204, 200	223, 600	227, 700	231, 000	234, 500						[7] 3, 041, 000	3, 141, 000	3, 389, 000	3, 421, 000	3, 543, 000

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture. Figures in parentheses denote unofficial estima tes, interpolation, etc. For each year is shown the harvest during the calendar year in the Northern Hemisphere and the succeeding harvest in the Southern Hemisphere.

[3] 4-year average.
[4] 3-year average.
[5] 1 year only.
[6] Revised estimates for all Russia distributed between European and Asiatic territory in the same ratio as the preliminary estimate.
[7] The estimate for the 5-year period, 1909–1918, given in this table is somewhat larger than the figures obtained by averaging those 5 years in Table 10. This is because in this table estimates for warring countries are for postwar boundaries, whereas in Table 10 they are for pre-war territory. As a result in excluding Russia, which lost territory in the war, a smaller area is excluded in this table than in Table 10.

TABLE 10.—*Wheat: World production, 1890–1927*

Year	World production excluding Russia and China, preliminary	Northern Hemisphere production excluding Russia and China, preliminary	European production excluding Russia, preliminary	Selected countries										
				Russia [1]	United States	Canada	India	Argentina	Australia	France	Italy	Hungary	Rumania	Germany
	1,000,000 bushels	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*
1890	1,878	1,802	1,056	213	378	----------	229	31	27	330	131	158	52	104
1891	1,989	1,904	900	181	584	----------	257	36	26	215	141	145	49	86
1892	2,053	1,938	1,045	266	528	----------	228	59	33	311	116	149	64	116
1893	2,076	1,936	1,097	482	428	----------	286	82	37	278	135	160	61	110
1894	2,406	2,018	1,080	477	516	----------	271	61	28	344	122	154	44	111
1895	2,126	2,039	1,057	310	467	----------	261	46	18	340	118	172	68	103
1896	2,057	1,986	1,103	412	544	----------	201	32	21	340	145	161	71	111
1897	1,893	1,790	842	340	610	----------	200	53	28	242	87	87	36	107
1898	2,552	2,374	1,168	459	772	----------	269	105	41	365	137	140	58	121
1899	2,319	2,150	1,113	454	636	----------	255	102	40	365	138	150	26	141
1900	2,210	2,064	1,096	423	603	----------	200	75	48	326	147	152	57	141
1901	2,472	2,357	1,103	428	789	----------	265	56	39	311	182	135	72	92
1902	2,510	2,368	1,207	607	725	----------	227	104	12	328	151	183	76	143
1903	2,651	2,412	1,266	621	664	----------	298	130	74	363	203	177	74	131
1904	2,478	2,238	1,116	667	597	----------	360	151	55	300	185	147	54	140
1905	2,673	2,441	1,223	636	727	----------	283	135	69	335	177	171	103	136
1906	2,950	2,694	1,356	543	757	----------	320	156	66	329	194	208	114	145
1907	2,619	2,344	1,176	571	638	----------	317	192	45	381	195	131	42	128
1908	2,544	2,283	1,181	628	645	112	229	156	63	317	168	165	55	138
1909 [2]	2,819	2,554	1,240	846	700	167	285	131	90	359	190	125	57	138
1910 [2]	2,777	2,495	1,201	836	635	132	360	146	95	253	153	181	111	142
1911 [2]	3,043	2,758	1,347	563	621	231	376	166	72	322	192	190	94	149
1912 [2]	3,093	2,770	1,284	801	730	224	371	187	92	334	166	185	89	160
1913 [2]	3,098	2,853	1,301	1,028	763	232	368	105	103	319	215	167	83	171
1914	2,834	2,601	1,072	[3] 834	891	161	312	169	25	283	170	118	49	146
1915	3,497	3,102	1,125	[4] 827	1,026	394	377	169	179	223	171	158	89	142
1916	2,734	2,457	1,049	[5] 531	636	263	323	84	152	205	178	----------	79	113
1917	2,574	2,178	740	622	637	234	382	235	115	[6] 135	140	----------	----------	84
1918	2,911	2,608	909	----------	921	189	370	180	76	226	183	----------	21	86
1919	2,821	2,517	899	----------	968	193	280	217	46	182	170	----------	[6] 66	[6] 80
1920	2,948	2,595	949	320	833	263	378	156	146	237	142	[6] 38	61	83
1921	3,169	2,787	1,216	205	815	301	250	191	129	323	[6] 194	53	79	108
1922	3,225	2,868	1,044	243	868	400	367	196	109	243	162	55	92	72
1923	3,551	3,119	1,257	249	797	474	372	248	125	276	225	68	102	106

1924	3,141	2,731	1,051	382	864	262	361	191	165	281	170	52	70	89
1925 [7]	3,389	3,026	1,390	713	676	411	331	191	115	330	241	72	105	118
1926 [7]	3,421	2,981	1,208	810	831	410	325	221	161	232	221	75	111	95
1927 [7]	3,543	3,136	1,262	750	872	444	334	239	110	284	196	73	97	121

Bureau of Agricultural Economics. For each year is shown the production during the calendar year in the Northern Hemisphere and the succeeding harvest in the Southern Hemisphere.

[1] Includes all Russian territory reporting for years named.

[2] The average production for the 1909–1913 period as computed from figures given here for estimated world total, Northern Hemisphere total, European total, and European countries whose boundaries were changed by the World War will not agree with estimates appearing elsewhere for present territory, due to changes in boundary.

[3] Total Russian Empire exclusive of the 10 Vistula Provinces of Russian Poland and the Province of Batum in Transcaucasia.

[4] Exclusive of Russian Poland, Lithuania, parts of present Latvia and Ukraine, and 2 Provinces of Transcaucasia.

[5] Beginning with this date estimated production is within present boundaries of the Union of Socialist Soviet Republics, excluding Turkestan, Transcaucasia, and the Far East, which regions in 1924 produced 51,706,000 bushels, and in 1925, 58,000,000 bushels.

[6] Beginning with this date production is within postwar boundaries and therefore not comparable with earlier years.

[7] Preliminary.

TABLE 11.—*Wheat: Farm stocks, quality, and shipments, United States, 1909–1927*

Year beginning July	Stocks of old wheat on farms July 1[1]	Stocks of old wheat in mills and elevators July 1[2]	Weight per measured bushel of new wheat[3]	Quality of new wheat[4]	Stocks of wheat on farms on Mar. 1 following[1]	Stocks of wheat in mills and elevators on Mar. 1 following[2]	Shipped out of county where grown[5]
	1,000 bush.	*1,000 bush.*	*Pounds*	*Per cent*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*
1909	14, 171		57. 9	90. 4	163, 371		428, 262
1910	36, 725		58. 5	93. 1	162, 705	98, 597	352, 906
1911	34, 071		57. 8	88. 3	122, 041	95, 710	348, 739
1912	23, 876		58. 3	90. 0	156, 471	118, 400	449, 881
1913	35, 515		58. 7	93. 2	151, 795	93, 627	411, 733
1914	32, 236		58. 0	89. 7	152, 903	85, 955	541, 198
1915	28, 972		57. 9	88. 4	244, 448	155, 027	633, 380
1916	74, 731		57. 1	87. 0	100, 650	89, 173	361, 038
1917	15, 611		58. 5	92. 4	107, 745	66, 138	325, 500
1918	8, 063		58. 8	93. 1	128, 703	107, 037	541, 666
1919	19, 261	19, 672	56. 3	82. 1	169, 904	123, 233	591, 552
1920	49, 546	37, 304	57. 4	88. 9	217, 037	87, 075	491, 035
1921	56, 707	27, 167	57. 0	85. 8	134, 253	75, 071	502, 470
1922	32, 359	28, 756	57. 7	87. 6	156, 087	102, 908	584, 089
1923	35, 894	37, 117	57. 4	87. 5	137, 721	98, 284	505, 792
1924	30, 981	36, 626	58. 9	93. 1	112, 095	67, 673	630, 819
1925	29, 357	25, 287	58. 3	89. 0	100, 137	76, 333	483, 519
1926	20, 973	28, 490	59. 1	92. 6	130, 230	85, 907	580, 112
1927[6]	27, 215	22, 075	58. 5	88. 4			

Bureau of Agricultural Economics. Prior to 1918 stocks in mills and elevators not included.

[1] Based on percentage of crop on farms as estimated by crop reporters.
[2] Based on percentage of crop as estimated by about 3.500 mill and elevator operators.
[3] Based on estimates of crop reporters on Nov. 1.
[4] Percentage of "a high medium grade" as estimated by crop reporters at time of harvest.
[5] Based on percentage shipped out as estimated by crop reporters.
[6] Preliminary.

TABLE 12.—*Wheat: Inspected receipts, by markets, 1917–1926*

Market	Year beginning July—									
	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
Minneapolis	90, 311	123, 119	127, 145	119, 107	109, 461	126, 508	99, 366	76, 960	118, 730	85, 466
Duluth	23, 481	113, 911	16, 611	50, 194	55, 995	71, 154	38, 460	102, 654	67, 447	49, 985
Kansas City	24, 848	69, 182	116, 694	115, 200	126, 025	77, 302	59, 948	86, 713	51, 571	90, 535
Chicago	12, 146	73, 446	62, 244	22, 190	45, 483	39, 207	43, 017	59, 831	19, 058	30, 811
St. Louis and East St. Louis	17, 120	43, 001	43, 685	27, 109	32, 262	27, 254	26, 859	26, 909	25, 148	26, 247
Omaha	10, 829	24, 066	30, 031	31, 031	30, 140	28, 760	19, 763	31, 660	16, 903	21, 642
Wichita	7, 000	15, 332	21, 100	16, 363	25, 186	21, 185	22, 151	29, 559	18, 972	28, 166
Portland, Oreg.	5, 957	10, 612	12, 468	28, 842	36, 566	22, 395	36, 732	21, 559	27, 892	35, 299
New York	22, 950	49, 990	28, 821	52, 750	33, 136	27, 368	9, 186	21, 978	6, 334	33, 855
Philadelphia	8, 180	34, 713	23, 816	19, 564	17, 598	36, 893	6, 252	18, 236	5, 767	6, 933
Baltimore	6, 434	25, 724	24, 522	25, 653	12, 817	13, 434	16, 480	14, 286	13, 862	21, 204
New Orleans	2, 710	16, 409	15, 678	67, 483	30, 325	24, 628	6, 261	32, 630	2, 235	8, 908
Galveston	1, 996	10, 128	26, 042	73, 334	44, 126	17, 400	7, 055	33, 953	2, 769	44, 781
All other inspection points	111, 858	200, 241	236, 976	204, 418	242, 466	224, 418	213, 715	256, 192	201, 036	308, 383
Total	345, 820	809, 874	785, 833	853, 238	841, 586	757, 906	605, 245	813, 120	577, 724	792, 215

Bureau of Agricultural Economics. Compiled from reports of licensed inspectors through district offices of Federal grain supervision.

TABLE 13.—*Wheat: Monthly marketings by farmers, as reported by about 3,500 mills and elevators, United States, 1917–1926*

Year beginning July	Percentage of year's receipts												
	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Season
1917	7.4	12.4	19.3	18.0	13.7	7.6	4.7	3.9	3.7	4.1	3.1	2.1	100.0
1918	17.6	19.9	18.0	13.8	8.7	7.3	4.6	3.1	2.0	1.6	1.9	1.5	100.0
1919	17.1	23.2	15.6	11.1	7.5	5.7	4.2	3.0	2.9	3.1	3.4	3.2	100.0
1920	12.1	14.3	15.9	10.6	6.9	6.2	5.5	5.3	4.9	5.0	6.4	6.9	100.0
1921	19.1	18.2	16.4	10.6	6.8	5.4	4.4	4.9	3.9	3.2	3.5	3.6	100.0
1922	14.8	17.3	14.2	12.0	8.6	7.4	5.5	5.1	4.3	3.7	3.4	3.7	100.0
1923	13.4	17.6	16.7	13.7	9.5	6.2	4.6	4.8	3.3	2.9	2.7	3.6	100.0
1924	13.6	19.8	17.5	14.5	8.6	5.6	5.3	4.2	2.5	1.6	3.1	3.7	100.0
1925	14.7	18.8	18.4	10.6	8.6	7.0	4.7	4.0	3.1	3.0	3.0	4.1	100.0
1926	22.4	20.7	12.8	9.3	5.3	5.0	4.6	4.8	3.5	2.4	3.4	5.8	100.0

Bureau of Agricultural Economics.

TABLE 14.—*Wheat: Supply and distribution and per capita disappearance in the United States, average 1899–1925, annual 1924–1927*

Item	Year beginning July							
	Average, 1899–1908	Average, 1909–1913	Average, 1914–1920	Average, 1921–1925	1924	1925	1926	1927
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
Supply:								
Stocks on farms, July 1 [1]	46,423	28,872	32,631	37,059	30,981	29,357	20,973	27,215
Stocks in country mills and elevators, July 1 [2]	27,000	29,000	26,997	30,991	36,626	25,287	28,490	22,075
Commercial visible (Bradstreet's) July 1	31,817	24,168	19,290	25,519	38,597	29,285	16,484	25,516
Stocks of flour (in terms of wheat) July 1 [2]	7,709	8,305	8,606	8,676	9,616	8,530	9,757	9,076
In merchant mills and elevators [3]	-------	-------	-------	-------	-------	21,648	24,640	37,321
In transit [3]	-------	-------	-------	-------	-------	9,000	7,390	11,360
New crop [4]	677,927	690,108	844,605	804,148	864,428	676,429	831,040	871,691
Imports (flour included) July 1 to June 30 [5]	753	1,834	19,806	17,473	6,201	15,679	13,264	-------
Total supply	791,629	782,287	951,935	923,866	986,449	815,215	952,038	-------
Distribution:								
Exports (flour included) July 1 to June 30 [5]	156,435	107,103	257,030	207,237	260,803	108,035	219,160	-------
Reexports July 1 to June 30 [5]	399	195	562	221	93	313	98	-------
Shipments (flour included) to Alaska, Hawaii, and Porto Rico [5]	[6] 2,034	2,540	2,546	2,836	2,871	2,741	3,082	-------
Estimated seed requirements [7]	70,444	72,326	88,312	86,840	84,024	83,180	85,000	-------
Carry-over on June 30—								
On farms [1]	40,654	32,485	36,127	29,913	29,357	20,973	27,215	-------
In country mills and elevators [2]	25,400	31,600	26,449	31,255	25,287	28,490	22,075	-------
Commercial visible (Bradstreet's)	28,668	25,326	18,265	26,822	29,285	16,484	25,516	-------
Flour (in terms of wheat) [2]	7,374	8,935	8,290	9,240	8,530	9,757	9,076	-------
In merchant mills and elevators [3]	-------	-------	-------	-------	-------	24,640	37,321	-------
In transit [3]	-------	-------	-------	-------	-------	7,390	11,360	-------
Accounted-for distribution	331,408	280,519	437,581	394,373	440,250	302,003	439,903	-------
Disappearance including food and feed	460,221	501,768	514,354	529,493	546,199	513,212	512,135	-------
Population, Jan. 1 (thousands) [8]	82,614	94,378	102,880	112,696	114,553	116,257	117,882	-------
Per capita disappearance, including food and feed, bushels	5.6	5.3	5.0	4.7	4.8	4.4	4.3	-------

Bureau of Agricultural Economics. Compiled as follows:

[1] From returns to the bureau from crop reporters.
[2] From Chicago Daily Trade Bulletin. Stocks in country mills and elevators, from 1899-1918, are stocks in second hands less visible supply on July 1, as given by Chicago Daily Trade Bulletin; subsequently same as Note 1.
[3] Bureau of the Census raised to represent all merchant mills.
[4] Based on returns to the bureau from crop reporters.
[5] From reports of Foreign and Domestic Commerce of the United States.
[6] 7 years' average.
[7] Amount of seed used per acre from returns to the bureau from inquiries sent to crop reporters.
[8] Bureau of the Census.

TABLE 15.—*Wheat: Inspected receipts, all inspection points, by classes, 1917–1926*

Class and year beginning July	Grade						Total
	No. 1	No. 2	No. 3	No. 4	No. 5	Sample	
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
Hard red spring:							
1917	52, 243	34, 765	13, 083	8, 828	3, 237	5, 864	118, 020
1918	175, 727	41, 097	20, 947	8, 581	2, 534	6, 629	255, 515
1919	12, 301	9, 334	23, 649	26, 023	20, 532	6, 668	98, 507
1920	57, 906	22, 487	31, 980	21, 346	22, 979	16, 516	173, 214
1921	36, 196	19, 525	31, 985	23, 149	10, 924	3, 450	125, 229
1922	110, 743	28, 214	15, 072	6, 994	2, 959	1, 721	165, 703
1923	52, 961	22, 321	25, 610	17, 454	11, 731	3, 602	133, 679
1924	102, 284	25, 007	16, 923	11, 385	2, 362	2, 978	160, 939
1925	86, 832	36, 280	28, 471	14, 683	5, 042	5, 173	176, 481
1926	51, 160	29, 373	23, 823	17, 677	4, 114	10, 706	136, 853
Durum:							
1917	1, 101	8, 297	5, 529	3, 240	785	1, 248	20, 200
1918	10, 613	26, 702	2, 239	811	314	441	41, 120
1919	1, 800	9, 936	4, 953	2, 346	905	265	20, 205
1920	3, 095	12, 692	5, 443	2, 304	751	422	24, 707
1921	6, 388	24, 267	9, 693	4, 692	2, 106	868	48, 014
1922	12, 709	37, 678	11, 977	6, 040	1, 677	1, 321	71, 402
1923	3, 425	16, 991	11, 965	4, 291	1, 426	718	38, 816
1924	8, 547	22, 366	7, 050	5, 508	623	1, 186	45, 280
1925	9, 733	28, 610	7, 975	4, 272	686	1, 568	52, 844
1926	2, 405	10, 548	6, 548	7, 764	1, 395	4, 403	33, 063
Hard red winter:							
1917	8, 692	24, 232	15, 516	5, 361	2, 945	3, 280	60, 026
1918	65, 715	60, 240	26, 494	15, 604	6, 174	3, 667	177, 894
1919	16, 577	85, 349	102, 279	60, 481	26, 965	10, 587	302, 238
1920	89, 287	161, 186	71, 331	21, 508	18, 689	27, 014	389, 015
1921	51, 345	199, 296	79, 086	15, 517	13, 053	46, 197	404, 494
1922	27, 693	122, 402	86, 335	26, 352	8, 166	24, 813	295, 761
1923	54, 549	84, 022	51, 689	22, 114	12, 744	15, 315	240, 433
1924	103, 247	237, 688	68, 640	21, 306	6, 224	13, 280	450, 385
1925	51, 498	92, 972	33, 812	9, 239	3, 918	3, 143	194, 582
1926	201, 893	145, 602	31, 067	10, 084	7, 821	10, 978	407, 445
Soft red winter:							
1917	6, 254	29, 403	27, 973	5, 949	9, 868	6, 114	85, 561
1918	91, 550	91, 898	16, 887	3, 289	2, 066	3, 965	209, 655
1919	12, 068	101, 035	80, 228	29, 524	11, 030	15, 630	249, 515
1920	22, 721	50, 756	18, 772	6, 648	2, 574	12, 249	113, 720
1921	5, 576	34, 009	37, 189	15, 272	5, 823	16, 558	114, 427
1922	3, 613	29, 854	28, 891	12, 507	3, 851	15, 900	94, 616
1923	10, 733	39, 597	18, 741	5, 983	2, 067	7, 840	84, 961
1924	10, 023	25, 730	15, 725	8, 349	2, 093	3, 623	65, 543
1925	8, 309	30, 939	10, 273	2, 877	1, 249	1, 463	55, 110
1926	35, 810	40, 147	11, 656	7, 903	2, 881	6, 011	104, 408
White:							
1917	6, 098	9, 026	6, 869	3, 547	1, 782	1, 736	29, 058
1918	11, 703	16, 467	7, 347	3, 180	703	6, 632	46, 032
1919	9, 390	17, 322	7, 933	1, 745	508	1, 041	37, 939
1920	3, 423	16, 657	9, 236	3, 224	864	861	34, 265
1921	6, 844	26, 437	10, 180	1, 650	355	788	46, 254
1922	7, 403	14, 118	8, 341	2, 322	528	459	33, 171
1923	8, 282	23, 159	9, 267	1, 098	163	584	42, 553
1924	2, 600	9, 009	8, 078	2, 543	354	221	22, 805
1925	5, 091	20, 435	11, 816	3, 840	649	543	42, 374
1926	10, 981	25, 696	8, 215	1, 999	423	659	47, 973
Mixed:							
1917	4, 714	12, 763	8, 277	3, 541	1, 879	1, 781	32, 955
1918	35, 035	28, 751	9, 061	3, 193	1, 231	2, 387	79, 658
1919	6, 919	26, 658	24, 751	11, 543	4, 310	3, 248	77, 429
1920	22, 558	49, 963	24, 677	9, 584	4, 020	7, 515	118, 317
1921	13, 048	46, 491	23, 665	7, 012	3, 736	9, 216	103, 168
1922	17, 265	41, 419	20, 162	8, 791	3, 133	6, 483	97, 253
1923	9, 775	26, 321	15, 015	6, 113	3, 159	4, 420	64, 803
1924	22, 281	23, 092	10, 442	7, 783	1, 731	2, 839	68, 168
1925	15, 119	24, 019	10, 115	4, 017	1, 533	1, 530	56, 333
1926	15, 877	20, 626	10, 011	7, 340	2, 597	6, 022	62, 473
Total:							
1917	79, 102	118, 486	77, 247	30, 466	20, 496	20, 023	345, 820
1918	390, 343	265, 155	82, 975	34, 658	13, 022	23, 721	809, 874
1919	59, 055	249, 634	243, 793	131, 662	64, 250	37, 439	785, 833
1920	198, 990	313, 741	161, 439	64, 614	49, 877	64, 577	853, 238
1921	119, 397	350, 025	191, 798	67, 292	35, 997	77, 077	841, 586
1922	179, 426	273, 685	170, 778	63, 006	20, 314	50, 697	757, 906
1923	139, 725	212, 411	132, 287	57, 053	31, 290	32, 479	605, 245
1924	248, 982	342, 892	126, 858	56, 874	13, 387	24, 127	813, 120
1925	176, 582	233, 255	102, 462	38, 928	13, 077	13, 420	577, 724
1926	318, 126	271, 992	91, 320	52, 767	19, 231	38, 779	792, 215

Bureau of Agricultural Economics. Compiled from reports of licensed inspectors through district offices of Federal grain supervision.

TABLE 16.—*Grain: Commercial stocks of United States grain, calendar year 1927*

Month	Wheat	Corn	Oats	Rye	Barley	Flax
	1,000 bush.	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*
January	69, 340	36, 069	47, 123	13, 092	7, 097	2, 684
February	59, 274	40, 783	47, 429	12, 880	6, 661	2, 328
March	59, 045	47, 655	45, 113	13, 897	6, 116	2, 089
April	52, 386	49, 859	38, 485	13, 905	5, 339	2, 014
May	39, 660	39, 050	30, 516	7, 818	3, 675	1, 834
June	29, 301	31, 234	22, 556	3, 783	3, 046	1, 396
July	21, 888	36, 314	17, 689	1, 018	2, 720	1, 445
August	35, 269	31, 850	11, 886	1, 454	3, 108	909
September	65, 642	23, 391	23, 227	2, 091	5, 041	584
October	82, 514	24, 982	26, 516	2, 608	6, 549	1, 583
November	93, 048	21, 733	25, 689	2, 077	5, 957	5, 353
December	95, 013	20, 300	24, 837	2, 970	5, 770	4, 703

Bureau of Agricultural Economics. Includes grain stored at 39 interior and seaboard points of accumulation, exclusive of grain in transit on lakes and canals. Reported on the Saturday nearest the 1st of the month.

TABLE 17.—*Stocks of United States grain in store in Canada and Canadian grain stored in the United States, calendar year, 1927*

Month	United States grain in Canada [1]					Canadian grain in United States [1]				
	Wheat	Corn	Oats	Rye	Barley	Wheat	Oats	Rye	Barley	Flax
	1,000 bush.	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*
January	1, 067	2, 147	352	1, 658	272	23, 394	228	2, 266	2, 942	14
February	549	1, 715	247	1, 704	300	14, 500	228	1, 922	2, 246	14
March	437	1, 788	218	1, 583	64	9, 532	171	1, 631	1, 677	17
April	318	1, 405	164	1, 376	77	6, 650	66	494	608	17
May	746	1, 781	635	3, 379	59	10, 724	117	689	2, 401	17
June	1, 344	1, 452	1, 432	869	0	16, 749	321	792	1, 573	57
July	1, 366	1, 203	1, 759	1, 465	13	7, 472	19	63	175	11
August	1, 280	1, 706	1, 253	589	5	4, 835	24	50	19	13
September	4, 249	1, 188	1, 238	686	66	3, 410	26	20	27	0
October	4, 560	2, 010	1, 435	1, 385	665	3, 784	0	124	27	0
November	7, 258	1, 994	1, 110	1, 390	344	8, 617	139	441	717	1
December	5, 187	2, 232	825	1. 208	152	31, 375	296	802	1, 768	12

Bureau of Agricultural Economics.

[1] Includes grain stored at lake or seaboard ports, exclusive of grain in transit on lakes and canals. Reported on the Saturday nearest the 1st of the month.

TABLE 18.—*Wheat: Visible supply in the United Staes,[1] 1909–1927*

Year beginning July	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
	1,000 bush.	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*
Average:												
1909–1913	24, 168	28, 569	37, 453	48, 202	56, 838	63, 908	66, 229	62, 228	58, 419	53, 802	43, 857	34, 183
1914–1920	19, 290	24, 822	38, 946	56, 235	69, 877	76, 250	75, 530	69, 586	60, 014	49, 475	35, 591	27, 728
1921–1925	25, 519	34, 513	52, 612	64, 541	66, 786	67, 445	68, 605	62, 988	59, 746	52, 365	43, 975	35, 777
1909	12, 771	12, 611	15, 514	28, 589	37, 820	41, 688	37, 949	36, 638	34, 461	37, 558	33, 771	24, 795
1910	16, 398	17, 053	38, 352	48, 437	53, 420	57, 002	59, 369	56, 357	50, 566	42, 697	34, 656	32, 769
1911	29, 639	46, 389	54, 581	61, 500	73, 792	81, 215	81, 501	70, 748	66, 982	59, 826	48, 022	35, 994
1912	27, 615	23, 595	26, 862	40, 998	52, 494	67, 575	77, 471	76, 131	73, 895	69, 000	53, 508	43, 697
1913	34, 420	43, 198	51, 980	61, 485	66, 663	72, 061	74, 854	71, 264	66, 191	59, 931	49, 327	33, 662
1914	17, 136	36, 456	39, 964	61, 784	76, 262	86, 332	85, 957	81, 776	58, 923	46, 287	31, 407	22, 871
1915	10, 734	9, 361	12, 679	22, 498	33, 338	60, 678	80, 150	77, 834	73, 748	66, 691	57, 658	52, 512
1916	50, 515	49, 591	65, 754	70, 420	75, 455	76, 191	73, 584	59, 477	54, 160	48, 525	32, 831	34, 876
1917	19, 901	11, 692	10, 315	13, 072	22, 855	29, 633	26, 476	20, 436	15, 484	10, 180	6, 656	4, 379
1918	2, 465	20, 462	54, 236	98, 155	131, 852	131, 584	129, 627	140, 607	127, 207	100, 505	55, 247	27, 626
1919	10, 873	25, 938	65, 479	95, 550	107, 783	101, 058	85, 117	68, 494	58, 632	51, 909	47, 756	41, 233
1920	23, 404	20, 226	24, 195	32, 169	41, 596	48, 273	47, 797	38, 475	31, 945	22, 229	17, 584	10, 598
1921	9, 960	28, 727	47, 159	62, 758	62, 767	53, 507	53, 776	48, 802	46, 714	42, 287	36, 644	31, 497
1922	20, 342	23, 077	32, 479	38, 025	39, 023	39, 764	43, 856	53, 823	54, 562	51, 862	49, 521	37, 203
1923	29, 403	40, 526	63, 922	72, 930	79, 034	82, 269	84, 030	75, 111	72, 914	66, 739	50, 383	48, 686
1924	38, 597	46, 193	79, 700	92, 353	100, 712	108, 997	99, 121	84, 476	76, 437	62, 766	49, 529	38, 328
1925	29, 285	34. 041	39, 800	56, 639	52, 394	52, 686	59, 244	52, 730	48, 105	38, 173	33, 798	23, 170
1926	16, 486	34, 575	72, 884	84, 724	81, 175	78, 910	70, 811	62, 317	61, 271	53, 827	42, 402	31, 115
1927	25, 516	37, 533	71, 908	88, 755	98, 675	100, 013						

Bureau of Agricultural Economics. Compiled from Bradstreet's. Includes grain stored at approximately 50 interior and seaboard points of accumulation and grain in transit by canals and lakes; also Pacific coast stocks at Portland, Tacoma, and Seattle. Bureau of Agricultural Economics is now securing and compiling data to replace this table as soon as enough years are covered.

[1] Saturday nearest the 1st of each month.

TABLE 19.—*Wheat, and wheat including flour: Domestic exports from the United States, by months, 1910–1928*

WHEAT

Year ended June 30	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total
	1,000 bush.	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*
Average:													
1910–1914	3, 371	8, 937	7, 919	7, 573	5, 533	5, 087	3, 940	2, 412	2, 493	3, 062	3, 686	2, 900	56, 913
1915–1921	10, 804	16, 166	19, 689	17, 975	15, 582	17, 282	14, 019	11, 474	11, 308	13, 382	13, 048	12, 292	173, 021
1922–1926	11, 602	26, 235	22, 858	19, 042	12, 241	9, 313	6, 530	4, 750	5, 725	4, 900	8, 278	8, 675	140, 149
1910	2, 783	6, 157	7, 156	8, 566	8, 427	3, 727	1, 428	1, 166	1, 204	2, 953	2, 487	626	46, 680
1911	862	2, 131	2, 226	3, 260	2, 505	3, 409	2, 802	1, 349	1, 883	1, 315	1, 371	616	23, 729
1912	3, 260	6, 253	5, 088	3, 350	2, 299	3, 084	2, 043	1, 243	1, 352	1, 386	603	199	30, 160
1913	545	5, 800	13, 153	15, 255	10, 584	9, 490	8, 441	4, 356	4, 569	6, 590	7, 159	5, 661	91, 603
1914	9, 404	24, 346	11, 971	7, 434	3, 852	5, 727	4, 985	3, 947	3, 457	3, 066	6, 810	7, 395	92, 394
1915	26, 357	24, 341	25, 867	19, 578	19, 182	28, 876	24, 088	24, 432	20, 541	22, 758	14, 227	9, 396	259, 643
1916	7, 956	16, 838	21, 526	18, 040	13, 500	12, 624	13, 461	15, 054	17, 293	16, 506	14, 571	5, 905	173, 274
1917	6, 355	11, 060	13, 108	11, 985	14, 279	14, 473	18, 906	10, 384	7, 885	14, 233	11, 359	15, 804	149, 831
1918	5, 059	5, 170	2, 613	5, 415	4, 878	4, 491	1, 914	1, 048	1, 687	1, 024	353	467	34, 119
1919	225	15, 120	26, 848	21, 319	16, 087	25, 084	9, 943	5, 992	10, 208	17, 338	14, 029	16, 390	178, 583
1920	5, 834	12, 941	17, 090	13, 687	15, 116	9, 520	8, 480	4, 938	6, 939	4, 176	10, 864	12, 840	122, 431
1921	23, 838	27, 694	30, 771	35, 803	26, 035	25, 903	21, 345	18, 469	14, 601	17, 642	25, 932	25, 235	293, 268
1922	24, 842	58, 537	30, 842	18, 206	13, 955	10, 451	10, 038	5, 577	7, 645	4, 856	9, 366	14, 006	208, 321
1923	14, 979	33, 703	25, 987	18, 282	10, 577	9, 676	7, 297	5, 991	4, 291	4, 943	9, 973	9, 252	154, 951
1924	8, 843	14, 198	15, 408	9, 239	4, 148	4, 950	4, 421	3, 095	2, 958	3, 747	2, 811	4, 975	78, 793
1925	4, 048	16, 835	32, 662	45, 128	27, 831	17, 791	8, 484	7, 387	9, 960	8, 424	9, 870	7, 070	195, 490
1926	5, 295	7, 901	9, 391	4, 354	4, 696	3, 695	2, 412	1, 700	3, 770	2, 533	9, 368	8, 074	63, 189
1927	16, 091	29, 075	23, 700	17, 589	14, 340	9, 622	8, 078	4, 889	5, 084	11, 363	8, 960	7, 459	156, 250
1928	8, 397	23, 402	33, 748	29, 236	20, 731	6, 917	------	------	------	------	------	------	-------

WHEAT, INCLUDING FLOUR, IN TERMS OF GRAIN[1]

	1,000 bush.	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*
Average:													
1910–1914	6, 119	12, 391	12, 987	13, 038	10, 637	10, 273	8, 377	6, 250	6, 356	6, 831	7, 620	6, 215	107, 103
1915–1921	17, 350	20, 865	24, 642	23, 832	21, 760	24, 558	21, 729	18, 156	19, 451	21, 920	21, 882	20, 885	257, 030
1922–1926	15, 934	32, 004	29, 375	26, 584	18, 885	15, 671	11, 836	10, 111	11, 772	9, 823	12, 431	12, 811	207, 237
1910	4, 711	8, 954	12, 708	14, 135	13, 199	9, 366	5, 131	3, 632	3, 850	5, 436	5, 087	2, 964	89, 173
1911	3, 233	5, 074	6, 361	7, 637	6, 944	8, 249	7, 187	5, 296	5, 783	5, 416	6, 051	4, 107	71, 338
1912	6, 410	10, 350	10, 950	9, 066	6, 766	8, 199	5, 984	5, 199	6, 053	5, 080	4, 554	3, 280	81, 891
1913	3, 118	9, 049	17, 158	20, 990	16, 401	14, 710	13, 668	9, 409	8, 988	11, 007	11, 357	9, 304	145, 159
1914	13, 125	28, 526	17, 759	13, 363	9, 873	10, 838	9, 914	7, 715	7, 108	7, 217	11, 098	11, 419	147, 955
1915	30, 343	27, 763	31, 681	25, 935	26, 195	37, 489	32, 380	31, 739	28, 483	29, 511	20, 558	13, 625	335, 702
1916	11, 826	20, 599	26, 514	24, 023	19, 520	20, 762	21, 223	21, 333	24, 372	22, 687	20, 860	12, 502	246, 221
1917	10, 771	15, 091	18, 384	16, 315	19, 216	18, 876	24, 230	13, 701	12, 641	18, 695	16, 437	21, 605	205, 962
1918	8, 422	9, 736	7, 182	11, 523	10, 614	15, 301	12, 450	10, 492	12, 207	12, 364	10, 915	11, 373	132, 579
1919	11, 154	19, 496	28, 348	24, 531	21, 989	33, 539	22, 103	15, 842	20, 314	31, 129	26, 305	32, 652	287, 402
1920	13, 797	20, 474	25, 206	21, 141	23, 580	15, 559	12, 358	10, 707	17, 102	13, 934	26, 221	21, 951	222, 030
1921	35, 135	32, 895	35, 182	43, 355	31, 209	30, 376	27, 361	23, 278	21, 039	25, 120	31, 877	32, 486	369, 313
1922	30, 661	67, 338	39, 310	25, 522	19, 813	15, 217	15, 231	11, 231	14, 673	10, 698	14, 485	18, 387	282, 566
1923	19, 308	39, 198	32, 099	25, 379	17, 890	16, 728	12, 751	12, 473	11, 011	10, 428	14, 593	13, 042	224, 900
1924	12, 999	20, 183	22, 779	19, 071	12, 503	13, 358	12, 486	10, 326	9, 659	8, 624	7, 401	10, 491	159, 880
1925	7, 758	21, 295	39, 537	53, 884	35, 425	24, 616	13, 126	11, 784	16, 480	12, 912	13, 114	10, 922	260, 803
1926	8, 944	12, 007	13, 152	9, 113	8, 794	8, 437	5, 587	4, 742	7, 039	6, 452	12, 558	11, 210	108, 035
1927	19, 819	35, 479	31, 031	24, 098	20, 655	15, 301	12, 821	8, 997	9, 183	16, 138	14, 123	11, 515	219, 160
1928	12, 100	28, 347	39, 765	36, 347	26, 961	12, 211	------	------	------	------	------	------	-------

Bureau of Agricultural Economics. Compiled from Monthly Summary of Foreign Commerce of the United States, and official records of the Bureau of Foreign and Domestic Commerce.

[1] Includes exports of flour milled from Canadian wheat imported in bond. Does not include reexports. Flour has been converted to grain on the following basis: 1909–1917, 1 barrel of flour is the product of 4.7 bushels of grain; 1918 and 1919, 4.5 bushels; 1920, 4.6 bushels; and 1921–1928, 4.7 bushels.

TABLE 20.—*Wheat, including flour: International trade, average 1910–1914, annual 1924–1927*

Country	Year ended June 30									
	Average 1910–1914		1924		1925		1926		1927, preliminary	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
PRINCIPAL EXPORTING COUNTRIES	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
Algeria	[1] 639	[1] 5,936	[1] 1,588	10,365	[1] 2,702	1,892	[2] 1,182	6,007	[2] 2,727	2,182
Argentina	[3] 3	85,220	[4] 3	170,009	[4] 10	125,289	[4] 2	99,803	------	139,790
Australia	[3] 7	[3] 49,732	2	83,384	3	124,112	------	77,486	------	[5] 60,296
British India	332	50,821	[1] 584	[6] 18,924	[7] 49	[6] 45,209	[7] 1,327	[7] 8,054	[7] 2,428	[7] 11,088
Bulgaria	------	[1] 11,182	[1] 18	[1] 2,442	[1] 1,943	323	------	4,128	[2] 1	[5] 2,132
Canada	447	94,286	430	343,781	651	194,849	372	320,649	408	304,948
Chile	[3] 170	[3] 2,593	34	4,756	2	8,822	731	1,696	758	516
Hungary	[1] 7,214	[1] 49,116	4	16,637	1,029	15,630	34	19,345	1	21,143
Rumania	[1] 196	[1] 54,630	6	[1] 5,793	752	4,788	280	8,558	[2] 1	[2] 9,045
Russia	[1] 556	[1] 164,862	------	21,367	------	301	------	27,085	------	49,202
Spain	6,009	71	([8])	277	2	692	1,466	683	56	747
Tunis	[1] 1,746	[1] 960	[1] 495	[1] 3,262	1,035	1,155	611	3,437	[5] 437	[5] 1,831
United States	1,808	104,967	28,079	159,880	6,201	260,802	15,679	108,035	13,264	219,160
Yugoslavia	------	------	------	[1] 5,770	------	[9] 9,570	------	[9] 11,549	------	[9] 10,034
PRINCIPAL IMPORTING COUNTRIES										
Austria	[1] 11,402	[1] 871	17,544	[1] 293	16,406	[1] 254	14,822	[2] 171	16,888	89
Belgium	72,877	21,965	43,176	3,412	45,135	5,791	42,689	3,656	41,170	1,381
Brazil [4]	[3] 20,495	------	22,827	29	28,592	17	27,452	22	[10] 31,282	[10] 38
Ceylon [9, 11]	------	------	[12] 753	------	791	------	896	------	927	------
Cuba	4,248	------	6,108	------	6,019	------	5,773	------	[13] 2,563	------
Czechoslovakia	------	------	19,487	[1] 509	23,902	[1] 888	19,388	212	20,155	84
Denmark	[1] 7,155	[1] 597	9,526	229	7,265	796	6,880	897	7,728	1,085
Egypt	[1] 8,244	[1] 59	7,825	171	9,476	88	12,520	26	8,861	64
Estonia	------	------	[9, 12] 878	------	[9] 840	------	971	------	944	------
Finland	[3] 4,912	([3, 8])	4,881	------	4,212	([2, 7])	4,879	------	4,854	([8])
France	44,081	1,230	54,213	2,797	43,818	2,646	35,978	1,955	53,527	540
French Indo-China [9, 11]	------	------	951	------	1,089	------	1,094	------	1,143	------
Germany	91,851	23,300	29,751	161	76,243	5,227	76,410	20,252	99,252	5,735
Greece	[3] 7,035	[3] 2	18,733	[1] 2	[9] 21,791	------	------	------	------	------
Irish Free State	------	------	------	------	19,101	------	18,539	90	19,511	37
Italy	56,431	3,637	77,552	7,680	102,126	5,867	66,339	2,469	88,184	1,034
Japan	[1] 4,116	[1] 28	28,955	340	15,205	1,985	27,980	4,899	18,458	4,014
Latvia	------	------	[1] 1,777	[1] 6	[9] 1,963	[1] 20	[9] 1,579	[1] 2	[9] 1,690	[2] 47
Netherlands	[1] 80,702	[1] 58,435	30,762	3,385	30,623	4,507	29,150	1,699	29,060	867
New Zealand	[3] 163	[3] 918	1,459	2	3,007	2	2,978	1	2,769	1
Norway	[1] 3,674	------	6,507	[1] 15	5,489	[1] 16	6,346	[1] 5	5,944	[2] 4
Poland	------	------	[1] 2,556	[1] 14	[1] 16,571	[1] 23	3,460	5,080	8,331	833
Sweden	[1] 7,080	[1] 23	12,214	309	11,461	107	6,677	639	8,484	2,576
Switzerland	[1] 16,937	[1] 14	16,283	([8])	14,355	([8])	14,245	([8])	17,220	([8])
Syria and Lebanon [9]	------	------	[13] 401	------	2,065	------	3,168	------	1,980	------
Union of South Africa	[3] 6,274	[3] 253	6,882	[14] 2	6,773	[11] 16	6,063	[11] 15	4,110	[11] 8
United Kingdom	219,474	4,493	224,136	13,741	234,512	[11] 18,448	201,313	[11] 13,420	226,908	[11] 10,292
Total, 41 countries	686,278	790,201	677,330	879,744	763,218	839,519	659,279	752,025	742,024	800,843

Bureau of Agricultural Economics. Official sources except where otherwise noted.

[1] Year ended July 31, International Yearbook of Agricultural Statistics.
[2] 10 months ended May 31, International Yearbook of Agricultural Statistics.
[3] Average of calendar years, 1909–1913.
[4] Year ended Dec. 31.
[5] 9 months.
[6] 12 months' sea trade, 9 months' land trade.
[7] Sea trade only.
[8] Less than 500 bushels.
[9] International Crop Report and Agricultural Statistics.
[10] International Yearbook of Agricultural Statistics.
[11] Wheat flour only.
[12] 11 months.
[13] 6 months.
[14] 10 months.

TABLE 21.—*Wheat: Inspection for export, and production, by classes, United States, average 1921–1925, annual 1923–1926, and July–December, 1927*

Year beginning July	Inspections of United States wheat for export								
	Hard red spring	Durum	Hard red winter	Soft red winter	White [1]	Mixed [2]	Flour as wheat	Other wheat [3]	Total
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
Average, 1921–1925	9,997	7,198	49,594	11,776	11,998	12,955	67,088	36,631	207,237
1923	1,022	4,908	19,640	9,810	18,653	5,435	81,087	19,325	159,880
1924	16,760	5,945	90,840	6,944	10,063	9,386	65,313	55,552	260,803
1925	3,338	4,170	7,358	2,282	16,914	5,944	44,846	23,183	108,035
1926	1,829	611	66,874	29,980	26,615	1,398	62,910	28,943	219,160
1927, July to December	4,218	1,879	36,272	9,671	21,660	1,650	33,300	47,081	155,731
	Estimated production [4]								
Average, 1921–1925	155,192	66,834	276,464	223,228	82,432				804,151
1923	126,876	55,269	241,851	271,631	101,767				797,394
1924	192,341	66,105	364,662	189,441	51,879				864,428
1925	156,053	65,008	205,799	169,792	79,777				676,429
1926	120,834	47,478	360,440	228,886	73,402				831,040
1927	199,136	80,225	317,983	180,282	94,065				871,691

Bureau of Agricultural Economics. Estimated production by classes based upon questionnaire surveys of local authorities; supplemented by judgments of cereal specialists. Inspections of United States wheat for export data furnished monthly by Federal grain supervision officers at the export markets.

[1] White wheat in the Pacific Northwest region consists of both spring and winter wheat; no attempt has been made to classify this wheat as other than white wheat, part of which is spring and part winter.
[2] 70 per cent of the exports of mixed wheat is estimated as durum.
[3] Exports of wheat other than reported as "Federal inspected" including exports through Canada.
[4] The spring and winter wheats listed do not include the spring and winter in the white wheats. Production estimates are based on the estimate of percentage classification by States as reported for 1920, 1923, and 1924; the percentages for 1921 and 1922 were interpolated from the 1920 and 1923 percentages. The estimated production for 1926 and 1927 is subject to revision.

TABLE 22.—*Wheat: Estimated price per bushel, received by producers, United States, 1909–1927*

Year beginning July	July 15	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	Weighted av.
Average:	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
1909–1913	93.6	89.5	87.7	88.1	87.3	86.7	88.4	89.2	88.9	89.3	90.3	89.0	88.7
1914–1920	167.4	166.6	165.0	164.8	162.2	161.7	167.9	170.6	170.0	177.1	183.8	178.8	165.1
1921–1925	108.8	109.8	108.4	110.9	113.8	117.1	123.3	126.9	126.4	121.2	123.0	120.1	113.7
1909	114.0	101.2	94.9	97.2	99.2	101.0	104.2	105.0	104.8	102.2	98.8	96.4	100.7
1910	97.1	97.4	94.8	92.1	89.4	88.4	89.2	87.6	84.6	84.2	85.4	85.3	91.7
1911	83.5	83.8	86.6	90.0	89.4	87.7	89.2	90.6	91.6	96.1	101.2	100.9	88.3
1912	94.4	87.8	84.6	83.6	79.9	76.1	78.0	80.2	79.8	80.0	81.8	82.0	83.3
1913	79.2	77.1	77.5	77.4	78.4	80.4	81.3	82.4	83.6	84.0	84.2	80.6	79.3
1914	76.7	84.9	93.4	95.4	97.9	103.2	118.8	131.8	132.6	135.6	135.6	117.2	99.4
1915	104.6	100.8	93.0	92.0	92.5	97.4	108.4	108.4	100.8	100.6	101.2	96.5	98.2
1916	100.0	119.2	133.8	147.4	159.4	155.3	157.6	164.6	172.2	213.0	247.2	234.3	144.4
1917	224.5	219.3	205.2	200.3	200.4	201.4	201.6	202.0	202.6	203.1	203.0	202.8	205.8
1918	203.8	205.0	205.7	205.9	205.1	204.5	206.2	207.8	211.1	222.6	229.8	225.2	206.3
1919	219.6	211.4	207.6	211.4	214.0	223.4	233.8	231.2	230.3	242.6	250.8	256.0	218.6
1920	242.9	225.4	216.5	201.2	165.8	146.4	149.2	148.2	140.4	122.1	119.0	119.8	182.9
1921	108.5	103.0	103.4	99.9	93.4	93.0	95.2	107.0	117.0	119.0	118.8	109.6	104.4
1922	99.8	92.6	89.2	94.1	99.4	103.2	104.6	104.4	106.0	108.4	108.2	100.8	98.0
1923	89.6	86.4	91.0	94.2	93.7	94.5	96.7	98.0	98.8	95.8	96.8	98.5	92.4
1924	105.8	116.8	114.2	129.7	133.6	141.1	162.1	169.8	164.0	140.5	149.1	152.7	127.8
1925	140.3	150.4	144.4	136.4	148.8	153.7	158.1	155.5	146.0	142.2	142.1	138.9	145.9
1926	127.7	125.1	117.7	121.4	123.6	122.8	122.2	122.8	120.9	117.2	123.2	130.1	122.8
1927	127.3	123.5	119.2	113.7	111.4	113.9							

Bureau of Agricultural Economics. Based on returns from special price reporters. Mean of prices reported on 1st of month and 1st of succeeding month, July, 1909–December, 1923.

TABLE 23.—*Wheat: Weighted average price per bushel of reported cash sales, 1909–1927*

NO. 1 NORTHERN SPRING, MINNEAPOLIS

Year beginning July	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Weighted av.[1]
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
Average:													
1909–1913	110	102	100	99	97	97	100	100	100	99	102	101	99
1914–1920	199	197	189	187	188	189	197	192	196	207	217	207	190
1921–1925	145	134	132	133	133	141	148	150	146	145	148	144	139
1909	129	106	104	104	105	112	114	114	115	111	110	109	109
1910	121	113	109	108	104	103	106	102	98	96	99	97	105
1911	99	105	109	110	105	102	106	106	108	110	116	113	107
1912	109	98	89	90	84	82	89	87	85	88	91	92	87
1913	91	88	87	84	85	86	87	93	92	91	94	92	88
1914	92	110	112	111	118	120	138	152	149	158	158	135	120
1915	144	118	97	102	102	114	129	126	114	122	122	111	109
1916	121	164	164	179	195	179	193	186	203	238	296	273	176
1917	266	247	217	217	217	217	217	217	217	217	217	217	220
1918	217	223	223	219	222	222	221	224	236	256	259	248	225
1919	266	259	256	267	285	307	301	267	284	306	309	293	272
1920	288	256	254	216	179	166	179	172	166	153	157	169	207
1921	167	148	151	134	125	131	134	151	151	158	161	149	143
1922	149	111	110	115	123	125	123	126	124	130	128	117	120
1923	112	118	121	120	114	116	119	121	121	121	122	125	117
1924	137	131	130	146	148	166	189	187	171	150	167	164	156
1925	159	164	150	149	155	169	173	167	161	164	162	163	161
1926	172	149	143	149	146	146	143	142	139	138	147	149	146
1927	147	143	134	129	130	132	------	------	------	------	------	------	--------

NO. 2 RED WINTER, ST. LOUIS

Year beginning July	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Weighted av.[1]
Average:													
1909–1913	98	99	101	105	102	105	108	106	105	104	106	97	100
1914–1920	183	182	185	184	183	188	200	196	195	206	215	198	183
1921–1925	125	128	134	138	139	147	156	156	150	148	146	139	137
1909	113	112	114	123	122	128	130	127	123	112	116	102	113
1910	107	102	102	100	96	98	103	96	93	90	94	88	99
1911	84	88	94	100	96	97	102	101	104	113	121	111	94
1912	103	104	103	109	104	107	111	109	108	109	104	99	105
1913	85	88	94	93	94	95	96	95	95	94	96	84	89
1914	87	93	110	110	111	118	140	157	150	154	150	119	110
1915	117	114	114	121	116	123	134	130	117	122	120	110	120
1916	125	145	160	173	187	183	196	188	205	266	304	265	163
1917	236	232	215	215	215	215	215	215	215	215	215	215	223
1918	221	221	219	222	222	232	241	238	255	271	260	241	223
1919	222	220	221	224	229	248	270	255	258	276	299	289	230
1920	273	251	258	226	202	199	202	190	166	141	158	150	213
1921	123	123	136	126	120	121	122	138	142	141	138	118	127
1922	112	109	114	123	129	136	137	139	136	139	133	123	121
1923	97	99	109	116	112	114	116	118	114	113	112	116	107
1924	135	138	140	156	163	179	210	202	186	177	186	189	159
1925	159	172	171	170	171	184	194	185	170	171	162	147	169
1926	142	134	136	140	136	137	138	135	130	129	142	150	138
1927	141	142	142	145	141	144	------	------	------	------	------	------	--------

NO. 2 HARD WINTER, KANSAS CITY

Year beginning July	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Weighted av.[1]
Average:													
1909–1913	96	93	94	95	92	94	97	95	95	96	97	96	95
1914–1920	187	185	181	177	178	181	191	185	187	199	210	------	--------
1921–1925	120	121	123	126	128	134	140	141	138	134	135	128	127
1909	114	102	102	106	104	110	111	111	110	108	107	108	107
1910	104	100	99	95	91	93	95	90	88	88	90	88	98
1911	87	93	95	104	100	100	105	103	105	109	111	109	97
1912	92	89	88	88	83	84	87	86	86	88	87	88	88
1913	82	83	87	84	83	84	85	86	88	87	90	85	84
1914	78	91	104	102	108	113	134	154	149	154	150	121	105
1915	136	126	107	107	103	112	120	120	105	112	110	100	119
1916	114	141	157	167	185	172	189	182	197	243	301	274	171
1917	268	261	212	212	212	212	212	212	212	212	212	------	--------
1918	220	216	216	216	215	224	231	226	239	262	260	247	219
1919	225	218	224	230	246	263	282	242	249	275	293	276	242
1920	268	245	244	207	176	169	172	162	155	133	147	138	183
1921	118	115	122	110	109	109	113	129	134	135	134	117	120
1922	113	104	104	113	117	117	114	115	116	120	116	104	113

[1] Average of daily prices weighted by car-lot sales.

TABLE 23.—*Wheat: Weighted average price per bushel of reported cash sales, 1909–1927*—Continued

Year beginning July	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Weighted av.
Average:	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1923	96	101	109	112	109	109	113	111	109	104	106	108	105
1924	120	119	120	137	143	162	182	181	171	151	163	160	135
1925	154	164	158	158	163	172	178	171	161	159	155	153	163
1926	137	131	132	139	137	138	137	135	133	131	142	144	135
1927	136	135	131	128	131	132	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Compiled from Minneapolis Daily Market Record, St. Louis Daily Market Reporter, and Kansas City Grain Market Review, formerly Daily Price Current. Data, 1899-1908, available in 1924 Yearbook, pp. 582-583, Table 32.

TABLE 24.—*Wheat: Weighted average price* [1] *per bushel of reported cash sales of all classes and grades, Chicago and combined markets, 1918–1927*

CHICAGO

Year beginning July	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Weighted av.[2]
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
Av. 1921-1925	124.2	122.9	118.5	122.8	125.7	135.3	139.8	143.6	137.5	135.0	137.6	130.3	126.2
1918	225.0	223.0	220.6	220.6	220.6	223.2	222.3	220.1	230.8	250.0	252.5	232.8	223.0
1919	223.9	222.2	221.9	225.7	242.0	249.5	272.2	235.5	242.0	289.8	295.8	280.5	226.1
1920	264.9	248.8	249.8	209.9	180.7	173.4	178.6	171.9	157.3	139.7	156.5	142.7	216.3
1921	124.1	119.8	124.4	112.0	107.9	110.5	112.7	128.6	129.7	132.4	132.7	115.9	121.6
1922	113.4	107.0	104.5	113.4	119.0	123.6	117.6	120.6	120.0	124.8	119.3	109.3	112.2
1923	99.1	99.6	101.0	106.8	103.1	105.3	108.6	110.3	109.7	106.1	107.8	113.7	102.5
1924	129.4	125.7	121.5	142.7	145.0	165.3	184.3	186.8	168.9	146.6	166.0	161.6	135.7
1925	155.0	162.4	141.3	139.0	153.5	171.7	175.7	171.7	159.4	164.9	162.0	150.8	159.0
1926	145.5	131.4	125.8	126.3	122.6	128.5	126.6	126.0	125.9	128.2	140.5	141.9	131.6
1927	141.6	138.0	130.9	126.9	124.5	128.6	------	------	------	------	------	------	------

FOUR MARKETS COMBINED [3]

Av. 121-1925	124.5	123.7	125.1	127.7	129.7	135.5	141.6	143.5	140.3	137.3	138.6	133.9	130.6
1918	221.2	219.9	218.5	218.3	219.4	220.6	220.7	221.3	232.4	249.2	251.7	238.2	221.7
1919	223.1	221.0	223.6	229.3	246.5	256.8	267.9	240.1	248.6	278.2	292.3	277.0	241.8
1920	270.6	247.3	246.6	205.8	175.1	167.2	172.4	163.2	154.3	135.3	147.6	144.1	193.3
1921	122.9	121.7	128.5	117.3	113.1	113.8	115.8	131.4	136.1	138.5	135.0	122.5	123.7
1922	117.1	107.6	108.6	113.4	120.0	121.3	118.3	120.0	120.4	125.0	122.2	112.6	116.0
1923	99.8	102.7	109.5	112.6	107.3	106.4	111.4	112.7	112.6	111.0	111.6	117.9	108.5
1924	126.2	124.6	128.3	145.0	148.9	166.4	189.5	185.9	174.0	153.4	167.4	163.7	145.6
1925	156.6	161.9	150.7	150.0	159.1	169.7	173.0	167.4	158.5	158.8	157.0	153.0	159.1
1926	142.1	135.9	137.7	142.2	138.5	139.0	138.2	135.8	133.3	133.4	144.6	148.8	139.0
1927	140.4	137.9	131.7	128.2	127.1	129.9	------	------	------	------	------	------	------

SIX MARKETS COMBINED [3]

1923	99.0	101.8	106.8	110.4	105.7	105.0	110.3	111.8	111.6	109.9	110.5	116.6	107.0
1924	125.7	123.5	128.3	144.8	148.2	163.6	188.8	184.8	172.1	150.8	165.5	161.6	145.3
1925	155.7	160.5	144.8	143.3	153.5	165.7	170.3	164.8	154.9	156.0	153.8	151.6	155.0
1926	141.6	135.3	135.6	139.4	137.7	139.5	138.8	136.2	133.6	134.7	145.1	148.6	138.3
1927	138.7	136.4	128.7	125.1	125.6	128.0	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Compiled from daily trade papers of markets named.

[1] The prices in this table are comparable with prices paid to producers, in that the latter are averages of the several prices reported which cover all classes and grades sold by producers.

[2] Average of daily prices weighted by car-lot sales.

[3] Four markets are Chicago, Minneapolis, Kansas City, and St. Louis; 6 markets also include Omaha and Duluth.

TABLE 25.—*Wheat, No. 1 northern spring: Average price per bushel of daily cash closing prices at Winnipeg, 1909–1927*

Year beginning July	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Average
Average:	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1909–1913	108	106	99	93	91	89	92	93	93	95	97	97	96
1914–1920	178	184	188	184	185	180	185	184	185	192	200	191	186
1921–1925	140	139	123	118	123	127	132	138	133	134	140	136	132
1909	131	119	100	97	97	98	103	103	104	103	98	93	104
1910	108	107	103	98	92	90	94	93	90	90	95	97	96
1911	95	101	101	100	99	95	95	97	98	101	104	106	99
1912	107	106	100	91	85	80	82	84	85	89	93	96	92
1913	97	95	89	81	83	84	85	88	90	90	93	94	89
1914	90	108	113	111	118	118	136	153	149	157	161	132	129
1915	135	125	95	96	102	107	122	126	110	115	117	111	113
1916	118	149	159	172	193	176	180	168	185	233	275	249	188
1917	234	240	225	221	221	221	221	221	221	221	221	221	224
1918	221	221	224	224	224	224	224	224	224	224	224	224	224
1919	216	215	253	253	252	244	240	231	236	240	238	232	238
1920	233	233	245	211	184	167	171	166	168	157	167	169	189
1921	164	156	133	104	102	105	108	131	137	140	144	131	130
1922	135	117	99	101	110	108	107	110	110	119	115	112	112
1923	106	111	104	96	96	91	94	97	95	96	103	112	100
1924	135	142	142	160	164	173	196	197	176	156	182	171	166
1925	162	167	138	127	142	157	156	155	148	157	154	153	151
1926	159	151	144	143	141	134	136	140	143	145	155	161	146
1927	162	160	145	144	145	140	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Compiled from Winnepeg Farmers' Advocate, July, 1909–September, 1923; November, 1923–December, 1927, from Minneapolis Daily Market Record.

TABLE 26.—*Wheat, good average quality, imported, red: Average spot price per bushel of 60 pounds at Liverpool, 1914–1927*

Year beginning July	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
Average, 1914–1920	196	201	199	204	208	209	214	214	220	222	220	210	------
1914	105	128	129	128	138	147	167	195	191	194	198	165	157
1915	163	161	167	171	159	173	194	190	200	193	171	155	175
1916	158	196	200	215	222	239	239	243	242	246	246	246	224
1917	250	250	238	226	226	226	232	232	239	232	232	232	235
1918	232	232	232	239	246	246	246	246	243	241	241	239	240
1919	229	221	216	216	211	195	190	175	211	237	234	240	215
1920	234	220	213	234	253	239	233	214	213	213	217	[1] 196	223
1921	[1] 171	[1] 159	[1] 156	[1] 131	[1] 126	[1] 137	144	166	162	158	160	143	151
1922	152	137	132	148	148	148	148	143	140	145	149	138	144
1923	138	132	125	126	126	125	126	([2])	128	123	125	126	------
1924	143	160	163	176	179	189	210	214	198	175	184	182	181
1925	176	188	180	166	171	189	183	181	164	167	173	172	176
1926	174	171	166	173	179	179	[3] 169	[4] 169	[4] 164	[4] 158	[4] 168	[3] 180	171
1927	[3] 176	[4] 166	[3] 157	[3] 155	[3] 155	[3] 156	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Compiled from Broomhall's 1921, 1925, and 1927 Corn Trade Yearbooks for the periods July, 1914, to May, 1921, and January, 1922, to December, 1926; and from Corn Trade News for the other months. Conversions at par of exchange beginning with January, 1926. Prior to that date conversions were at current exchange rate.

[1] No. 2 hard winter when available, otherwise No. 2 red winter.
[2] No quotations.
[3] No. 2 hard winter.
[4] No. 2 red winter.

TABLE 27.—*Wheat-ground and wheat-milling products, merchant mills,*[1] *by months, 1926–27*

Year and month	Mills reporting	Wheat ground	Production: Wheat flour	Production: Wheat-grain offal	Daily (24-hour) capacity in wheat flour	Percentage of total capacity operated
1926	*Number*	*1,000 bushels*	*1,000 barrels*	*1,000 pounds*	*1,000 barrels*	*Per cent*
July	1,034	43,942	9,570	768,231	646	57.0
August	1,034	47,654	10,447	820,795	647	62.1
September	1,034	49,317	10,843	844,774	647	67.0
October	1,043	48,727	10,678	834,908	649	63.3
November	1,049	43,922	9,618	750,008	653	58.9
December	1,053	40,624	8,909	695,130	647	53.0
1927						
January	1,041	39,354	8,624	676,292	648	53.3
February	1,051	36,569	8,023	624,025	654	53.3
March	1,050	40,908	8,953	701,790	659	50.3
April	1,058	38,184	8,308	659,199	659	48.5
May	1,052	38,924	8,497	672,824	656	51.8
June	1,052	39,085	8,500	675,003	661	49.4
Total		507,210	110,970	8,722,979		

COMPARATIVE STATEMENT FOR 797 IDENTICAL MILLS WHICH REPORTED EACH MONTH[2]

Year and month	Wheat ground	Production: Wheat flour	Production: Wheat-grain offal	Average weight of wheat per barrel of flour	Average weight of offal per bushel of wheat	Daily (24-hour) capacity in wheat flour	Percentage of total capacity operated
1926	*1,000 bushels*	*1,000 barrels*	*1,000 pounds*	*Pounds*	*Pounds*	*1,000 barrels*	*Per cent*
July	43,676	9,513	763,455	275.5	17.5	632	57.9
August	47,327	10,377	814,853	273.6	17.2	634	62.9
September	48,905	10,754	837,568	272.8	17.1	635	67.7
October	48,195	10,563	825,575	273.8	17.1	635	64.0
November	43,155	9,453	736,582	273.9	17.1	636	59.4
December	39,927	8,758	682,761	273.5	17.1	631	53.4
1927							
January	38,676	8,478	665,216	273.7	17.2	633	53.5
February	35,785	7,853	610,199	273.4	17.1	634	53.9
March	39,928	8,739	684,838	274.2	17.2	636	50.9
April	37,179	8,088	641,732	275.8	17.3	634	49.1
May	37,891	8,273	655,284	274.8	17.3	631	52.5
June	38,109	8,287	657,847	275.9	17.3	637	50.1
Total	498,753	109,136	8,575,910				

Bureau of Agricultural Economics. Compiled from Bureau of Census monthly reports on wheat-milling products.

[1] These returns include only mills which have been manufacturing at the rate of 5,000 or more barrels of flour annually.
[2] The 797 concerns, which owned or operated 968 mills, produced approximately 90.3 per cent of the total flour (114,689,930 barrels, final figures) reported at the biennial Census for Manufactures for 1925.

TABLE 28.—*Wheat ground in United States mills, census years, 1879–1925*

Year	Merchant mills	Custom mills	All mills	Year	Merchant mills	Custom mills	All mills
	1,000 bush.	*1,000 bush.*	*1,000 bush.*		*1,000 bush.*	*1,000 bush.*	*1,000 bush.*
1879			304,776	1914	545,728	[2] 6,988	552,716
1889			385,750	1919	612,563	6,105	618,668
1899	471,307	[1] 18,607	489,914	1921	521,234	[3] 6,105	527,339
1904	494,095	[2] 6,988	501,083	1923	538,312	[3] 6,105	544,417
1909	496,480	6,988	503,468	1925	530,593	[3] 6,105	536,698

Bureau of Agricultural Economics. Rearranged from reports of the Bureau of the Census, as follows: 1879 from 1880 Census of Manufactures, p. 451; 1889 from 1900 Census of Manufactures, Vol. IX, part 3, p. 365; 1899 and 1904 from 1910 Census of Manufactures, Vol. X, p. 415; 1909, 1914 and 1919 from 1919 Census of Manufactures, Vol. X, p. 110; 1921 from 1923 Biennial Census of Manufactures; 1923 and 1925 from 1925 Biennial Census of Manufactures.

[1] Difference between all mills and merchant mills. [2] 1909 custom mills. [3] 1919 custom mills.

TABLE 29.—*Wheat ground in merchant mills in the United States 1924–1928*

Year ended June 30	Wheat ground as reported	Percentage of total [1]	Estimated total wheat ground
	1,000 bushels	*Per cent*	*1,000 bushels*
1924			
July	35, 871	88. 04	40, 744
Aug	44, 179	88. 13	50, 129
Sept	44, 969	88. 22	50, 974
Oct	50, 811	88. 31	57, 537
Nov	43, 606	88. 39	49, 334
Dec	37, 799	88. 48	42, 720
Jan	41, 834	88. 57	47, 233
Feb	39, 180	88. 66	44, 191
Mar	38, 809	88. 74	43, 733
Apr	35, 680	88. 83	40, 167
May	36, 688	88. 92	41, 260
June	36, 293	89. 01	40, 774
Total or average	485, 719	88. 51	548, 796
1925			
July	39, 272	89. 09	44, 081
Aug	45, 433	89. 18	50, 945
Sept	47, 857	89. 27	53, 609
Oct	51, 863	89. 36	58, 038
Nov	41, 982	89. 44	46, 939
Dec	40, 428	89. 53	45, 156
Jan	45, 010	89. 62	50, 241
Feb	37, 720	89. 71	42, 065
Mar	33, 548	89. 79	37, 381
Apr	31, 066	89. 88	34, 515
May	31, 874	89. 97	35, 445
June	35, 526	90. 06	39, 465
Total or average	481, 579	89. 53	537, 880
1926			
July	40, 651	90. 14	45, 116
Aug	42, 818	90. 23	47, 472
Sept	45, 952	90. 32	50, 895
Oct	49, 799	90. 41	55, 099
Nov	42, 416	90. 49	46, 892
Dec	41, 656	90. 58	46, 007
Jan	40, 358	90. 67	44, 511
Feb	34, 573	90. 76	38, 093
Mar	38, 027	90. 84	41, 862
Apr	35, 234	90. 93	38, 748
May	34, 657	91. 02	38, 076
June	37, 251	91. 11	40, 886
Total or average	483, 392	90. 58	533, 657
1927			
July	43, 942	91. 19	48, 187
Aug	47, 654	91. 28	52, 206
Sept	49, 317	91. 37	53, 975
Oct	48, 727	91. 46	53, 276
Nov	43, 922	91. 54	47, 981
Dec	40, 624	91. 63	44, 335
Jan	39, 354	91. 80	42, 870
Feb	36, 569	91. 90	39, 792
Mar	40, 908	91. 90	44, 514
Apr	38, 184	92. 00	41, 505
May	38, 924	91. 70	42, 447
June	39, 085	91. 70	42, 623
Total or average	507, 210	91. 60	553, 710
1928			
July	38, 597	91. 70	42, 090
Aug	44, 099	91. 90	47, 986
Sept	48, 131	91. 90	52, 373
Oct	49, 792	92. 00	54, 121
Nov	44, 882	92. 20	48, 679
Dec	42, 605	92. 20	46, 209

Bureau of Agricultural Economics.

[1] Monthly percentages represent a straight line interpolation between an estimated average percentage of 88, for the calendar year 1923 and 90.1 for the calendar year 1925, both centered on July 1. In 1927 the percentages are as reported by the Bureau of the Census based on the 1925 census. The 1923 percentage was obtained as follows: Reported grindings May–December, 1923, were 324,378,000 bushels. From May–December, 1924, and 1925 reported grindings were 68.6 per cent and 69.2 per cent of total reported for the year. Comparable percentages from Northwestern miller's estimates of flour production for 1923 and 1924 are 68.9 and 68.8 per cent assuming that all mills produced during May–December 68.5 per cent of total for the year, the reported grindings of 324,378,000 for May–December are 88 per cent of the grindings of all mills. The 1925 percentage was obtained by dividing total of monthly reported grindings by total millings reported in 1925 census. The monthly grindings for January–December, 1925, estimated from the interpolated percentages were adjusted so as to give the 1925 census total.

TABLE 30.—*Bread: Average retail price per pound (baked weight) in leading cities of the United States, 1913–1927*

Year beginning July—	July 15	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	Average
Average:	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1914–1920	8. 9	8. 9	9. 0	9. 0	9. 0	8. 8	8. 9	9. 0	9. 0	9. 1	9. 3	9. 3	9. 0
1921–1925	9. 1	9. 1	9. 0	9. 0	9. 0	8. 9	9. 0	9. 0	9. 0	9. 0	9. 0	9. 0	9. 0
1913	5. 6	5. 6	5. 6	5. 6	5. 6	5. 6	6. 2	6. 2	6. 2	6. 2	6. 2	6. 2	5. 9
1914	6. 2	6. 3	6. 4	6. 4	6. 4	6. 5	6. 8	7. 1	7. 1	7. 1	7. 2	7. 2	6. 7
1915	7. 1	7. 1	7. 0	7. 0	6. 9	6. 9	6. 9	7. 0	7. 0	7. 0	7. 0	7. 0	7. 0
1916	7. 0	7. 1	7. 7	8. 1	8. 4	7. 8	7. 9	8. 0	8. 1	8. 4	9. 5	9. 6	8. 1
1917	9. 9	10. 2	9. 9	9. 9	9. 9	9. 3	9. 4	9. 5	9. 6	9. 8	9. 9	10. 0	9. 8
1918	10. 0	9. 9	9. 9	9. 8	9. 8	9. 8	9. 8	9. 8	9. 8	9. 8	9. 8	9. 9	9. 8
1919	10. 0	10. 1	10. 1	10. 1	10. 2	10. 2	10. 9	11. 1	11. 2	11. 2	11. 5	11. 8	10. 7
1920	11. 9	11. 9	11. 9	11. 8	11. 6	10. 8	10. 8	10. 6	10. 5	10. 3	9. 9	9. 8	11. 0
1921	9. 7	9. 7	9. 6	9. 5	9. 3	9. 1	8. 8	8. 6	8. 7	8. 7	8. 8	8. 8	9. 1
1922	8. 8	8. 7	8. 7	8. 7	8. 7	8. 6	8. 7	8. 7	8. 7	8. 7	8. 7	8. 7	8. 7
1923	8. 8	8. 7	8. 7	8. 7	8. 7	8. 7	8. 7	8. 7	8. 7	8. 7	8. 7	8. 7	8. 7
1924	8. 7	8. 8	8. 8	8. 8	8. 9	8. 9	9. 2	9. 5	9. 4	9. 4	9. 4	9. 4	9. 1
1925	9. 4	9. 4	9. 4	9. 4	9. 4	9. 4	9. 4	9. 4	9. 4	9. 4	9. 4	9. 4	9. 4
1926	9. 4	9. 4	9. 4	9. 4	9. 4	9. 4	9. 4	9. 4	9. 4	9. 4	9. 4	9. 3	9. 4
1927	9. 3	9. 3	9. 3	9. 3	9. 3	9. 3	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Compiled from Bureau of Labor Statistics reports of retail prices, monthly.

TABLE 31.—*Flour, wheat, spring patents: Average wholesale price per barrel, Minneapolis, 1909–1927*

Year beginning July	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Average
Average:	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls*	*Dolls.*	*Dolls.*	*Dolls.*
1909–1913	5.48	5.27	5.00	4.94	4.81	4.76	4.88	4.88	4.87	4.81	4.94	4.98	4.97
1914–1920	9.52	9.87	9.37	9.24	9.17	9.27	9.61	9.42	9.42	9.97	10.54	10.15	9.63
1921–1925	7.99	7.73	7.56	7.51	7.50	7.79	8.03	8.18	8.00	7.95	8.01	7.87	7.84
1909	6.21	5.89	5.14	5.29	5.22	5.48	5.58	5.45	5.52	5.38	5.42	5.33	5.49
1910	6.20	5.79	5.75	5.21	5.03	5.01	5.28	4.91	4.75	4.64	4.89	4.81	5.19
1911	4.88	4.88	4.98	5.25	5.05	5.05	5.00	5.10	5.10	5.10	5.43	5.60	5.12
1912	5.43	5.24	4.68	4.63	4.59	4.13	4.26	4.43	4.43	4.43	4.43	4.63	4.61
1913	4.66	4.57	4.45	4.33	4.18	4.15	4.26	4.52	4.54	4.51	4.51	4.51	4.43
1914	4.62	5.78	6.02	5.58	5.79	6.01	6.86	7.54	7.16	7.61	7.41	6.78	6.43
1915	6.78	6.42	5.13	5.23	5.28	5.98	6.23	6.13	5.70	5.90	5.79	5.29	5.82
1916	5.68	7.69	8.26	9.08	9.56	8.60	9.00	8.45	9.44	11.33	14.09	13.08	9.52
1917	12.86	13.22	11.15	10.84	10.24	10.07	9.85	10.05	9.89	9.90	9.42	9.89	10.62
1918	10.45	10.53	10.49	10.44	10.41	10.44	10.42	10.69	11.22	12.09	12.52	12.00	10.98
1919	12.15	12.13	11.54	12.03	13.20	14.48	14.97	13.73	13.41	14.69	15.49	14.64	13.54
1920	14.12	13.33	13.02	11.45	9.74	9.28	9.94	9.38	9.10	8.30	9.04	9.40	10.51
1921	9.27	8.34	8.62	7.67	7.39	7.26	7.33	8.17	8.27	8.46	8.32	7.71	8.07
1922	7.95	7.22	6.68	6.76	6.88	6.86	6.71	6.72	6.72	7.00	6.80	6.35	6.89
1923	6.21	6.37	6.45	6.43	6.21	6.30	6.44	6.51	6.49	6.56	6.83	7.12	6.49
1924	7.72	7.69	7.52	8.19	8.22	9.03	9.80	10.02	9.34	8.54	9.12	8.86	8.67
1925	8.78	9.04	8.52	8.52	8.81	9.52	9.85	9.46	9.19	9.20	9.00	9.32	9.10
1926	9.27	8.50	7.87	8.08	7.85	8.02	7.95	7.85	7.74	7.75	8.23	8.39	8.12
1927	8.26	7.98	7.52	7.43	7.38	7.37	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Compiled from the Minneapolis Daily Market Record.

TABLE 32.—*Bran, pure: Average price per ton in 100-pound sacks, Minneapolis, 1909–1927*

Year beginning July	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Average
Average:	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1909–1913	19.48	20.19	19.92	19.47	19.78	20.68	21.89	21.85	21.54	20.73	20.28	18.68	20.37
1914–1920	28.55	29.64	28.26	26.99	28.40	29.60	31.23	30.29	30.61	31.41	30.26	27.99	29.44
1921–1925	19.64	20.82	21.58	22.68	24.38	25.92	26.29	25.50	24.74	24.54	23.79	21.28	23.43
1909	20.50	20.08	18.95	19.06	19.02	20.49	22.66	22.09	20.83	18.42	17.93	16.40	19.70
1910	19.62	19.89	18.54	17.99	19.23	21.17	21.73	21.25	20.82	21.43	21.48	19.62	20.23
1911	20.08	20.96	21.42	21.43	22.05	22.99	23.96	25.25	25.13	24.23	23.32	20.22	22.59
1912	20.82	19.25	19.13	19.01	18.48	18.51	19.53	18.03	17.21	16.25	16.58	16.94	18.31
1913	16.40	20.75	21.54	19.86	20.10	20.22	21.59	22.63	23.71	23.34	22.08	20.23	21.04
1914	18.36	22.21	21.71	19.69	20.89	21.54	22.31	22.60	21.17	22.45	19.86	19.62	21.04
1915	20.42	20.06	18.18	18.19	19.96	18.41	18.78	20.08	18.53	18.62	18.99	18.32	19.04
1916	17.67	20.00	21.95	24.45	27.07	25.93	28.75	28.64	34.17	38.57	34.20	26.05	27.34
1917	32.29	31.80	30.26	30.64	33.30	38.62	32.50	32.50	32.85	33.04	31.09	30.70	32.47
1918	26.00	29.31	29.06	28.46	27.80	32.94	47.26	42.83	38.09	39.56	37.88	34.36	34.46
1919	37.26	41.99	37.66	36.89	37.97	41.58	41.98	42.67	46.70	50.25	53.18	50.74	43.24
1920	47.83	42.09	39.03	30.62	31.81	28.20	27.05	22.63	22.73	17.39	16.62	15.52	28.46
1921	14.83	15.49	14.53	13.60	19.75	21.75	22.16	25.41	24.58	23.06	21.77	16.05	19.42
1922	15.90	14.77	17.62	22.48	23.37	24.89	26.67	27.96	28.72	28.41	27.30	21.18	23.27
1923	20.35	24.89	28.50	28.54	26.34	25.28	25.56	24.40	23.37	21.64	18.59	20.04	23.96
1924	23.07	24.29	23.62	25.23	26.14	30.94	30.52	25.14	23.89	23.94	27.33	26.85	25.91
1925	24.05	24.64	23.61	23.56	26.31	26.74	26.53	24.57	23.16	25.65	23.96	22.02	24.57
1926	22.50	22.59	22.27	21.21	24.17	26.99	27.61	28.41	27.99	27.83	28.91	27.11	25.63
1927	25.73	27.32	26.38	26.45	28.94	30.60	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Compiled from the Minneapolis Daily Market Record.

TABLE 33.—*Middlings, flour: Average price per ton in 100-pound sacks, Minneapolis, 1909–1927*

Year beginning July	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Average
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls*	*Dolls.*	*Dolls.*	*Dolls*	*Dolls.*
Average:													
1909–1913	24.38	25.36	25.25	24.65	24.04	23.74	24.10	24.53	24.10	23.64	23.46	23.43	24.22
1914–1920	38.56	40.62	38.71	35.74	35.40	35.63	37.36	36.25	36.32	36.99	37.42	36.77	37.15
1921–1925	26.57	26.85	26.72	27.17	27.25	27.90	28.85	28.22	27.74	27.57	27.86	27.46	27.51
1909	25.22	25.78	23.59	23.50	23.15	23.58	24.92	24.98	24.10	23.00	22.82	21.96	23.88
1910	23.90	24.56	23.74	23.15	23.00	23.56	23.41	23.54	22.82	23.05	23.25	23.25	23.44
1911	24.55	26.19	26.73	26.04	26.25	26.25	26.13	27.25	26.79	26.50	26.48	26.23	26.28
1912	27.38	27.00	26.71	25.62	23.55	22.30	22.50	22.36	21.78	20.67	19.72	20.96	23.38
1913	20.83	23.29	25.49	24.93	24.26	22.99	23.55	24.50	24.99	24.96	25.04	24.75	24.13
1914	24.86	27.54	27.23	26.06	26.78	27.58	28.94	27.80	26.17	26.64	27.33	27.48	27.04
1915	29.57	29.93	25.71	23.21	22.48	22.89	23.26	25.94	24.76	24.00	24.04	23.56	24.95
1916	23.22	26.79	28.76	31.94	34.99	34.23	35.75	34.21	38.35	42.29	41.70	42.74	34.58
1917	49.00	50.38	44.89	45.79	46.02	45.35	41.50	41.50	41.53	41.43	37.08	32.86	43.11
1918	27.35	30.66	30.44	29.90	29.32	37.82	53.30	46.08	43.46	45.38	50.71	49.70	39.51
1919	53.22	58.33	57.72	52.68	49.72	50.81	51.57	53.32	54.31	57.72	61.47	61.06	55.16
1920	62.70	60.68	56.20	40.58	38.52	30.71	27.20	24.82	25.66	21.49	19.64	20.00	35.68
1921	20.13	21.06	21.16	20.62	22.00	23.38	23.25	26.58	28.26	26.29	25.76	23.21	23.48
1922	23.58	22.82	22.40	25.45	25.92	26.61	28.24	29.43	30.30	30.56	31.38	29.90	27.22
1923	28.94	29.09	30.07	30.37	27.85	26.86	27.60	27.20	25.79	24.88	23.15	24.47	27.19
1924	28.58	29.56	29.99	31.60	31.83	34.84	36.57	31.33	28.84	29.19	33.24	33.50	31.59
1925	31.60	31.70	29.98	27.81	28.64	27.82	28.58	26.56	25.53	26.92	25.77	26.20	28.09
1926	27.45	28.02	27.74	27.62	28.14	31.32	31.56	32.39	31.58	31.34	33.39	36.07	30.55
1927	38.11	38.85	34.01	32.33	33.02	33.78							

Bureau of Agricultural Economics. Compiled from the Minneapolis Daily Market Record.

TABLE 34.—*Wheat futures: Volume of trading in wheat futures at nine markets, by crop years,*[1] *1921–1927*

Market	Volume					
	1921–22	1922–23	1923–24	1924–25	1925–26	1926–27
	1,000 bush.	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*
Chicago Board of Trade	12,814,318	9,625,226	6,124,323	16,587,110	15,869,025	10,619,503
Chicago Open Board	343,300	354,173	261,833	446,476	601,858	429,332
Minneapolis	594,147	555,396	438,091	927,811	972,544	631,835
Kansas City	532,647	340,428	270,842	577,006	546,449	502,492
Duluth	168,817	226,061	142,467	189,576	233,977	154,918
St. Louis	178,096	98,448	65,772	126,006	96,569	69,507
Milwaukee	24,316	26,161	13,550	21,980	23,966	20,667
New York	(2)	(2)	(2)	(2)	(2)	149,203
Seattle	(2)	(2)	(2)	(2)	584	6,894
Total	14,655,641	11,225,893	7,316,878	18,875,965	18,344,972	12,584,351

Market	Percentage					
	1921–22	1922–23	1923–24	1924–25	1925–26	1926–27
	Per cent	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Chicago Board of Trade	87.44	85.74	83.70	87.86	86.50	84.39
Chicago Open Board	2.34	3.16	3.58	2.36	3.28	3.41
Minneapolis	4.05	4.95	5.99	4.91	5.30	5.02
Kansas City	3.63	3.03	3.70	3.06	2.98	3.99
Duluth	1.15	2.01	1.95	1.02	1.28	1.23
St. Louis	1.22	.88	.89	.67	.52	.55
Milwaukee	.17	.23	.19	.12	.13	.16
New York						1.19
Seattle					.01	.06
Total	100.00	100.00	100.00	100.00	100.00	100.00

Grain Futures Administration.

[1] The crop year includes trading from July 1 of one year to June 30 of the following year.
[2] No trading in grain futures in New York prior to August, 1926, and Seattle prior to May, 1926.

TABLE 35.—*Wheat futures: Dealings on Chicago Board of Trade, 1921–1927*

Year	May			July		
	Amount of future transactions	Settled by delivery of warehouse certificate	Actual grain delivered	Amount of future transactions	Settled by delivery of warehouse certificate	Actual grain delivered
	1,000 bush.	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*
1921				2, 220, 351		
1922	6, 075, 842			2, 695, 392		
1923	3, 704, 517			2, 470, 696		
1924	3, 037, 720			914, 407		
1925	7, 733, 848	7, 645	2, 479	3, 173, 397	5, 124	4, 225
1926	7, 495, 083	2, 725		3, 235, 225	1, 789	
1927	3, 845, 526	4, 610		1, 969, 061	6, 835	

Year	September			December		
	Amount of future transactions	Settled by delivery of warehouse certificate	Actual grain delivered	Amount of future transactions	Settled by delivery of warehouse certificate	Actual grain delivered
	1,000 bush.	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*
1921	1, 499, 096			2, 324, 822		
1922	1, 383, 597			1, 720, 916		
1923	1, 550, 345			1, 746, 958		
1924	1, 838, 308	12, 018	2, 895	2, 862, 926	8, 106	4, 701
1925	2, 966, 221	5, 036	1, 708	3, 392, 829	1, 708	701
1926	1, 957, 725	9, 466		2, 602, 906	6, 723	
1927	1, 897, 730			2, 250, 461		

Grain Futures Administration.

TABLE 36.—*Rye: Acreage, production, value, exports, etc., United States, 1849, 1859, 1866–1927*

Year	Acreage harvested	Average yield per acre	Production	Price per bushel received by producers Dec. 1	Farm value Dec. 1	Value per acre [1]	Price per bushel of No. 2 rye at Chicago year beginning July 1 [2]	Foreign trade, including flour, year beginning July 1 [3]			
								Domestic exports	Imports	Net exports [4]	
										Total	Percentage of production
	1,000 acres	*Bush. of 56 lbs.*	*1,000 bushels*	*Cents*	*1,000 dollars*	*Dollars*	*Cents*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*Per cent*
1849			*14,189*					419	34	385	2.7
1859			*21,101*					69		69	.3
1866	1, 548	13. 5	20, 865	82. 2	17, 150	11. 08	98	235	246	137	.7
1867	1, 689	13. 7	23, 184	100. 4	23, 281	13. 78	140	565	229	395	1.7
1868	1, 651	13. 6	22, 505	94. 9	21, 349	12. 93	114	93	201	[5] 61	.3
1869			*16,919*								
1869	1, 658	13. 6	22, 528	77. 0	17, 342	10. 46	80	199	412	126	.6
1870	1, 176	13. 2	15, 474	73. 2	11, 327	9. 63	78	87	116	126	.8
1871	1, 070	14. 4	15, 366	71. 1	10, 928	10. 21	67	833	249	717	4.7
1872	1, 049	14. 2	14, 889	67. 6	10, 071	9. 60	61	612	214	676	4.5
1873	1, 150	13. 2	15, 142	70. 3	10, 638	9. 25	76	1, 923	164	1, 977	13.1

[1] Based on farm price Dec. 1.
[2] 1866–1908 from annual reports of Chicago Board of Trade, averages of weekly range as follows: 1866, No. 1 in store; 1867–1908, No. 2 in store. Beginning 1909, prices are from Chicago Daily Trade Bulletin and are averages of daily prices weighted by car-lot sales.
[3] 1849, 1859, 1866–1917 compiled from Commerce and Navigation of the United States; 1918, Foreign Commerce and Navigation of the United States; 1919–1926, Monthly Summary of Foreign Commerce and Navigation of the United States, June issues, and January and June issues, 1927. Rye—General imports 1849–1909; imports for consumption 1910–1927. Rye flour—General imports, 1850–1871; imports for consumption 1872–1927. Rye flour converted to rye on the basis that 1 barrel of rye flour is the product of 6 bushels of grain.
[4] Total exports (i. e., domestic plus foreign) minus total imports.
[5] Net imports.

TABLE 36.—*Rye: Acreage, production, value, exports, etc., United States, 1849, 1859, 1866–1927*—Continued

Year	Acreage harvested	Average yield per acre	Production	Price per bushel received by producers Dec. 1	Farm value Dec. 1	Value per acre	Price per bushel of No. 2 rye at Chicago year beginning July 1	Foreign trade, including flour, year beginning July 1: Domestic exports	Imports	Net exports: Total	Net exports: Percentage of production
	1,000 acres	*Bush. of 56 lbs.*	*1,000 bushels*	*Cents*	*1,000 dollars*	*Dollars*	*Cents*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*Per cent*
1874	1,117	13.4	14,991	77.4	11,610	10.39	92	267	299	224	1.5
1875	1,360	13.0	17,722	67.1	11,894	8.75	70	589	241	639	3.6
1876	1,468	13.9	20,375	61.4	12,505	8.52	66	2,235	99	2,234	1.1
1877	1,413	15.0	21,170	57.6	12,202	8.64	55	4,250	430	4,159	19.6
1878	1,623	15.9	25,843	52.5	13,566	8.36	47	4,878	478	4,947	19.1
1879	*1,842*	*10.8*	*19,832*								
1879	1,842	13.7	25,201	67.6	17,040	9.25	68	2,944	533	2,965	11.8
1880	1,768	13.9	24,541	75.6	18,565	10.50	89	1,955	474	1,942	7.9
1881	1,789	11.6	20,705	93.3	19,327	10.80	92	1,004	954	907	4.4
1882	2,228	13.4	29,960	61.5	18,439	8.28	62	2,206	974	2,222	7.4
1883	2,315	12.1	28,059	58.1	16,301	7.04	58	6,248	656	6,338	2.3
1884	2,344	12.2	28,640	51.9	14,857	6.34	59	2,974	239	3,020	1.1
1885	2,129	10.2	21,756	57.9	12,595	5.92	59	217	174	127	.6
1886	2,130	11.5	24,489	53.8	13,181	6.19	53	377	18	494	.2
1887	2,053	10.1	20,693	54.5	11,283	5.50	54	95	--------	103	.5
1888	2,365	12.0	28,415	58.8	16,722	7.07	47	309	--------	309	.1
1889	*2,172*	*13.1*	*28,422*								
1889	2,172	13.1	28,378	42.3	11,991	5.52	45	2,281	198	2,241	7.9
1890	2,184	12.1	26,414	62.6	16,536	7.57	71	358	141	340	.1
1891	2,284	14.7	32,761	77.1	25,264	11.31	82	12,069	84	12,005	3.7
1892	2,251	13.0	29,253	53.6	15,674	6.96	55	1,494	9	1,485	5.1
1893	2,178	13.1	28,592	50.2	14,360	6.59	46	249	--------	249	.9
1894	2,164	13.7	29,613	49.4	14,622	6.76	52	32	13	19	.1
1895	2,153	14.5	31,139	42.2	13,151	6.11	38	1,011	--------	1,011	3.2
1896	2,126	13.6	28,913	38.8	11,231	5.28	34	8,576	1	8,574	3.0
1897	2,077	16.1	33,433	43.2	14,454	6.96	48	15,562	33	15,529	4.6
1898	2,071	15.9	32,888	44.5	14,640	7.07	52	10,170	1	10,169	3.1
1899	*2,054*	*12.4*	*25,569*								
1899	2,054	14.8	30,334	49.6	15,046	7.33	54	2,382	--------	2,382	7.9
1900	2,042	15.1	30,791	49.8	15,341	7.51	50	2,346	--------	2,345	7.6
1901	2,033	15.3	31,103	55.4	17,220	8.47	57	2,712	--------	2,712	8.7
1902	2,051	17.2	35,255	50.5	17,798	8.68	51	5,445	1	5,444	1.5
1903	2,074	15.4	31,990	54.0	17,272	8.33	60	784	34	751	2.3
1904	2,085	15.3	31,805	68.9	21,923	10.51	75	30	21	9	.0
1905	2,141	16.4	35,168	60.4	21,241	9.92	64	1,388	1	1,387	3.9
1906	2,186	16.7	36,559	58.5	21,381	9.78	64	770	1	769	2.1
1907	2,107	16.4	35,455	72.5	25,709	11.86	80	2,445	2	2,443	6.9
1908	2,175	16.4	35,768	72.8	26,023	11.96	78	1,296	1	1,295	3.6
1909	*2,196*	*13.4*	*29,520*								
1909	2,196	16.1	35,406	72.2	25,548	11.63	76	242	30	212	.6
1910	2,185	16.0	34,897	71.5	24,953	11.42	84	40	227	[5] 187	.5
1911	2,127	15.6	33,119	83.2	27,557	12.96	91	31	134	[5] 103	.3
1912	2,117	16.8	35,664	66.3	23,636	11.16	65	1,855	1	1,854	5.2
1913	2,557	16.2	41,381	63.4	26,220	10.25	64	2,273	37	2,236	5.4
1914	2,541	16.8	42,779	86.5	37,018	14.57	105	13,027	147	12,880	3.0
1915	3,129	17.3	54,050	83.4	45,083	14.41	99	15,250	566	14,684	2.7
1916	3,213	15.2	48,862	122.1	59,676	18.57	154	13,703	428	13,275	2.7
1917	4,317	14.6	62,933	166.0	104,447	24.19	211	17,186	834	16,352	2.6
1918	6,391	14.2	91,041	151.6	138,038	21.60	161	36,467	638	35,829	3.9
1919	*7,679*	*9.9*	*75,993*								
1919	6,307	12.0	75,483	133.2	100,573	15.95	170	41,531	1,077	40,454	5.4
1920	4,409	13.7	60,490	126.8	76,693	17.39	162	47,337	452	46,885	7.8
1921	4,528	13.6	61,675	69.7	43,014	9.50	97	29,944	700	29,244	4.7
1922	6,672	15.5	103,362	68.5	70,841	10.62	81	51,663	99	51,564	5.0
1923	5,171	12.2	63,077	65.0	40,971	7.92	70	19,902	2	19,900	3.2
1924	*3,744*	*14.9*	*55,674*								
1924	4,150	15.8	65,466	106.5	69,696	16.79	125	50,242	1	50,241	7.7
1925	3,974	11.7	46,456	78.2	36,340	9.14	96	12,647	--------	12,646	2.7
1926	3,578	11.4	40,795	83.4	34,024	9.51	101	21,698	1	21,697	5.3
1927 [6]	3,670	16.0	58,572	85.3	49,945	13.61	--------	--------	--------	--------	--------

Bureau of Agricultural Economics. Production figures are estimates of the crop-reporting board; italic figures are census returns.

[6] Preliminary.

TABLE 37.—*Rye: Acreage and production, by States, average 1921–1925, annual 1925–1927*

State	Acreage				Production			
	Average, 1921–1925	1925	1926	1927 [1]	Average, 1921–1925	1925	1926	1927 [1]
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*
Connecticut	3	1			64	19		
New York	48	37	25	21	784	610	388	368
New Jersey	55	44	41	36	986	792	779	720
Pennsylvania	175	113	93	78	2,903	1,921	1,488	1,326
Ohio	73	55	50	35	1,064	825	875	560
Indiana	252	145	145	119	3,238	1,653	2,102	1,618
Illinois	173	80	83	62	2,690	1,104	1,245	899
Michigan	441	216	173	178	5,856	2,700	2,336	2,617
Wisconsin	358	256	256	238	5,336	3,789	3,840	4,046
Minnesota	765	448	440	409	13,196	5,824	5,940	7,485
Iowa	42	32	31	31	755	525	542	542
Missouri	25	22	24	24	306	264	310	264
North Dakota	1,401	1,587	1,222	1,381	17,179	15,870	9,287	23,063
South Dakota	285	177	103	154	4,154	1,682	639	2,772
Nebraska	173	205	253	274	2,174	2,522	2,606	4,110
Kansas	59	43	41	45	646	383	480	576
Delaware	5	5	4	3	69	75	60	45
Maryland	17	18	15	14	266	342	270	214
Virginia	38	36	43	42	446	432	580	496
West Virginia	10	10	12	10	116	130	156	130
North Carolina	65	80	104	94	618	920	1,352	1,128
South Carolina	6	7	8	9	67	74	112	117
Georgia	18	20	22	26	166	186	264	260
Kentucky	18	15	18	14	203	195	279	154
Tennessee	19	20	32	26	190	220	448	208
Arkansas	1	1	1	1	10	11	11	10
Oklahoma	35	33	36	22	423	396	558	198
Texas	15	14	20	14	161	56	380	98
Montana	134	80	107	134	1,699	1,000	1,284	2,412
Idaho	9	3	3	3	153	60	46	48
Wyoming	37	57	51	51	486	684	714	638
Colorado	85	85	89	85	874	850	1,024	892
New Mexico	2	1	1	1	28	4	18	6
Utah	9	3	4	4	90	33	36	40
Washington	18	15	18	22	218	165	216	352
Oregon	26	10	10	10	357	140	130	160
United States	4,899	3,974	3,578	3,670	68,007	46,456	40,795	58,572

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

[1] Preliminary.

TABLE 38.—*Rye: Yield per acre and estimated price per bushel, December 1, by States, average 1914–1920, 1921–1925, annual 1923–1927*

State	Yield per acre							Estimated price per bushel						
	Av., 1914–1920	Av., 1921–1925	1923	1924	1925	1926	1927	Av., 1914–1920	Av., 1921–1925	1923	1924	1925	1926	1927
	Bu.	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Cts.*	*Cts.*	*Cts*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
Connecticut	20.1	18.8	18.0	18.0	19.0	------	------	159	139	125	140	130	------	------
New York	17.6	16.3	16.3	17.0	16.5	15.5	17.5	139	100	91	113	100	100	105
New Jersey	18.3	18.0	17.8	17.5	18.0	19.0	20.0	138	97	94	113	93	95	97
Pennsylvania	17.0	16.6	17.0	16.0	17.0	16.0	17.0	130	98	91	113	105	97	105
Ohio	16.3	14.7	15.5	16.0	15.0	17.5	16.0	125	89	78	111	88	88	92
Indiana	15.1	12.8	14.0	13.5	11.4	14.5	13.6	124	83	73	106	85	85	88
Illinois	16.9	15.3	15.0	14.5	13.8	15.0	14.5	124	85	75	107	90	86	92
Michigan	14.6	13.4	14.0	14.5	12.5	13.5	14.7	126	78	62	106	78	78	89
Wisconsin	17.0	15.0	14.8	17.0	14.8	15.0	17.0	127	79	65	109	76	84	90
Minnesota	17.7	17.0	13.5	22.0	13.0	13.5	18.3	124	72	53	108	71	76	85
Iowa	17.8	17.6	17.6	18.0	16.4	17.5	17.5	118	78	66	102	80	82	86
Missouri	13.0	12.2	12.5	13.5	12.0	12.9	11.0	128	98	88	105	120	113	110
North Dakota	11.9	12.0	7.8	15.0	10.0	7.6	16.7	120	67	48	104	65	73	80
South Dakota	16.4	13.8	11.5	14.0	9.5	6.2	18.0	115	67	49	102	67	73	79
Nebraska	15.5	12.5	12.0	14.5	12.3	10.3	15.0	110	70	56	97	71	76	77
Kansas	14.7	10.8	8.5	14.2	8.9	11.7	12.8	121	82	75	98	98	94	92
Delaware	15.2	13.6	14.4	13.5	15.0	15.0	15.0	137	109	96	125	120	110	115
Maryland	15.6	15.8	15.8	15.0	19.0	18.0	15.3	134	107	97	122	114	105	110
Virginia	12.9	11.6	12.0	11.5	12.0	13.5	11.8	138	109	107	128	127	112	115
West Virginia	13.7	11.6	10.0	11.2	13.0	13.0	13.0	139	108	103	129	120	110	110
North Carolina	9.8	9.2	10.4	9.0	11.5	13.0	12.0	163	137	135	149	157	125	135
South Carolina	10.5	10.4	10.5	11.0	10.5	14.0	13.0	237	201	173	190	210	175	175
Georgia	9.1	9.2	9.0	9.2	9.3	12.0	10.0	202	173	190	183	180	160	165
Kentucky	12.4	11.4	11.7	11.0	13.0	15.5	11.0	140	115	103	127	125	108	120
Tennessee	10.0	9.8	10.0	11.0	11.0	14.0	8.0	159	128	116	138	130	120	129
Arkansas	10.6	10.4	9.0	11.0	11.0	11.0	10.0	157	122	120	131	130	125	140
Oklahoma	12.8	12.0	12.0	14.0	12.0	15.5	9.0	129	89	90	101	110	90	99
Texas	12.9	10.6	12.0	16.0	4.0	19.0	7.0	153	111	98	111	120	97	95
Montana	14.2	12.5	11.0	14.0	12.5	12.0	18.0	119	65	51	91	74	75	73
Idaho	16.5	16.4	19.0	10.0	20.0	15.5	16.0	115	81	68	122	80	73	75
Wyoming	15.9	14.0	13.0	10.0	12.0	14.0	12.5	126	66	66	88	64	67	69
Colorado	13.2	10.3	12.0	9.0	10.0	11.5	10.5	109	67	56	85	67	71	70
New Mexico	------	10.2	12.0	16.0	4.0	18.0	6.0	------	92	90	100	100	85	75
Utah	11.6	9.7	11.4	6.6	11.0	9.0	10.0	131	85	90	107	100	80	82
Washington	13.8	11.7	15.7	7.9	11.0	12.0	16.0	142	98	72	133	125	100	90
Oregon	13.6	13.0	15.0	10.0	14.0	13.0	16.0	142	98	93	136	110	96	95
United States	14.8	13.8	12.2	15.8	11.7	11.4	16.0	124.2	77.6	65.0	106.5	78.2	83.4	85.3

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

TABLE 39.—*Rye: Acreage, yield per acre, and production in specified countries, average 1909–1913, annual 1924–1927*

Country	Acreage					Yield per acre					Production				
	Average, 1909–1913 [1]	1924	1925	1926	1927, preliminary	Average, 1909–1913 [1]	1924	1925	1926	1927, preliminary	Average, 1909–1913 [1]	1924	1925	1926	1927, preliminary
NORTHERN HEMISPHERE	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
NORTH AMERICA															
Canada	117	891	852	754	743	17.9	15.4	16.1	16.1	20.1	2,094	13,751	13,688	12,114	14,951
United States	2,236	4,150	3,974	3,578	3,670	16.1	15.8	11.7	11.4	16.0	36,093	65,466	46,456	40,795	58,572
Total	2,353	5,041	4,826	4,332	4,413	16.2	15.7	12.5	12.2	16.7	38,187	79,217	60,144	52,909	73,523
EUROPE															
Norway	37	25	22	23	23	26.3	25.5	27.9	28.1	27.6	973	637	614	647	634
Sweden	977	654	871	838	850	24.7	16.6	30.6	27.8	22.3	24,100	10,883	26,615	23,325	18,940
Denmark	636	466	530	514	-------	30.0	22.4	25.9	24.3	-------	19,104	10,435	13,745	12,480	10,236
Netherlands	557	489	491	488	482	29.5	31.8	33.4	28.0	28.2	16,422	15,560	16,396	13,644	13,594
Belgium	672	560	571	558	573	35.2	36.9	38.0	36.0	35.0	23,644	20,671	21,704	20,108	20,078
Luxemburg	26	16	16	17	17	25.0	19.0	22.5	20.8	21.2	651	304	360	353	361
France	3,095	2,196	2,147	1,958	1,970	17.0	18.3	20.3	15.4	18.7	52,501	40,241	43,662	30,076	36,798
Spain	1,988	1,820	1,846	1,866	1,860	13.9	14.4	16.2	12.6	14.5	27,636	26,281	29,880	23,504	27,059
Portugal	[2] 271	474	-------	591	-------	8.9	14.3	-------	6.2	-------	[3] (2,300)	6,793	4,599	3,638	4,428
Italy	346	310	311	298	307	18.3	19.7	21.6	21.8	19.3	6,317	6,114	6,704	6,496	5,937
Switzerland	60	48	47	49	49	29.7	29.9	34.9	32.3	33.8	1,783	1,433	1,642	1,583	1,657
Germany	12,713	10,525	11,635	11,693	11,610	29.0	21.4	27.3	21.6	23.2	368,337	225,573	317,418	252,191	269,040
Austria	1,110	928	949	972	935	21.4	17.4	22.8	19.3	19.4	23,785	16,189	21,656	18,712	18,168
Czechoslovakia	2,605	2,070	2,091	2,054	2,030	24.4	21.6	27.8	22.4	24.1	63,538	44,735	58,097	45,909	48,937
Hungary	1,608	1,638	1,699	1,729	1,653	19.5	13.5	19.1	18.2	13.7	31,377	22,103	32,526	31,416	22,569
Yugoslavia	732	483	490	500	529	12.3	11.5	16.0	14.9	11.2	9,004	5,541	7,864	7,454	5,923
Greece	76	-------	-------	110	124	14.9			12.8	9.8	1,129	457	959	1,412	1,217
Bulgaria	542	414	454	461	463	15.4	10.4	15.8	17.4	17.8	8,345	4,303	7,154	8,009	8,243
Rumania	[4] 1,286	671	668	730	695	[4] 16.1	8.9	12.0	15.4	13.7	[4] 20,644	5,963	7,997	11,242	9,553
Poland	12,127	10,915	12,118	11,937	12,138	18.1	13.2	21.2	16.5	18.4	218,943	143,882	257,408	197,289	223,944
Lithuania	1,749	1,328	1,339	1,109	1,240	13.9	13.8	19.5	12.5	17.1	24,283	18,295	26,116	13,811	21,157
Latvia	888	657	659	621	633	14.7	11.9	18.8	9.9	16.1	13,061	7,849	12,406	6,119	10,196
Estonia	486	394	382	336	367	16.7	13.8	18.8	13.4	18.3	8,129	5,451	7,187	4,490	6,719
Finland	589	564	579	565	568	17.8	20.0	23.6	21.1	20.2	10,490	11,260	13,683	11,909	11,463
Russia, European	58,604	61,322	62,481	64,138	-------	12.1	10.3	12.3	13.2	-------	710,842	630,459	[5] 770,651	[5] 847,985	-------
Total, European countries reporting all years shown	44,193	36,705	39,385	38,802	38,992	21.6	17.3	23.3	18.8	20.0	953,963	633,268	917,089	728,287	780,970
Estimated European total, excluding Russia	45,200	37,800	40,600	40,100	40,200	-------	-------	-------	-------	-------	[6] 978,000	652,000	938,000	747,000	987,000

ASIA															
Turkey		281	294	196				15.5					4,570		
Russia (Asiatic)	2,451	4,515	5,289	3,989		10.1	10.8	8.5	12.4		24,663	48,631	[5] 44,853	[5] 49,354	
Total Northern Hemisphere countries reporting all years shown	46,546	41,746	44,211	43,134	43,405	21.3	17.1	22.1	18.1	19.7	992,150	712,485	977,233	781,196	854,493
Estimated total excluding Russia and China	48,020	43,300	45,900	44,800	45,000						1,023,000	738,000	1,005,000	807,000	878,000
SOUTHERN HEMISPHERE															
Argentina	85	387	499	544	894	7.5	3.8	9.5	6.0	7.7	640	1,457	4,733	3,268	6,850
Chile	5	4	5	3		22.2	11.2	15.0	19.0		111	45	75	57	
Union of South Africa	108	128				6.7	7.6				724	974			
Australia	9	4	4			12.7	14.2	12.8			114	57	51		
New Zealand	[7] 4	2	1			[7] 28.5	17.0	23.0			[7] 114	34	23		
Total Northern and Southern Hemisphere countries reporting all years shown	46,631	42,133	44,710	43,678	44,299	21.3	16.9	22.0	18.0	19.4	992,790	713,942	981,966	784,464	861,313
Estimated world total excluding Russia and China	48,300	43,800	46,600	45,500	46,100						[6] 1,025,000	742,000	1,012,000	812,000	887,000

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture. Figures are for crops harvested during the calendar year in the Northern Hemisphere and the succeeding harvest in the Southern Hemisphere.

[1] Where changes in boundary have occurred averages are estimates for territory within present boundaries.
[2] 3-year average.
[3] Estimated on the basis of acreage reported and an average yield of 8.9 bushels to the acre.
[4] 4-year average.
[5] Revised estimate apportioned between European and Asiatic Russia in the same ratio as the preliminary estimate.
[6] The estimate for the 5-year period, 1909-1913, given in this table is somewhat larger than the figures obtained by averaging those 5 years in table 40. This is because in this table estimates for warring countries are for post-war boundaries, whereas in Table 40 they are for pre-war territory. As a result, in excluding Russia, which country lost territory in the war, a smaller area is excluded in this table than in Table 40.
[7] 2-year average.

TABLE 40.—*Rye: World production, 1894–1927*

Year	World production excluding Russia and China, preliminary	Northern Hemisphere production excluding Russia and China, preliminary	European production excluding Russia, preliminary	Selected countries: Russia [1]	United States	Germany	France	Poland	Hungary	Czechoslovakia	Sweden	Belgium	Spain	Austria
	1,000,000 bushels	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*
1894	663	662	618	931	30	279	75		58		19		18	83
1895	620	618	573	773	31	260	72		47		20	20	18	65
1896	664	663	621	790	29	285	70		51		25		16	74
1897	599	598	551	654	33	273	48		36		24		19	63
1898	667	666	619	738	33	297	67		46		21		21	80
1899	710	708	664	912	30	342	67		50		22		21	85
1900	675	673	629	920	31	337	59		42		26	20	21	55
1901	690	688	644	755	31	321	58		44		22	21	28	76
1902	733	731	682	919	35	374	46		53		23	22	15	82
1903	768	767	721	912	32	391	58		51		24	22	23	81
1904	755	754	709	1,008	32	396	53		46		21	22	17	92
1905	782	781	732	737	35	378	59		53		26	21	27	98
1906	787	785	736	668	37	379	51		54		27	21	31	99
1907	751	749	700	815	35	384	56		42		21	23	27	86
1908	827	826	776	790	36	423	52		48		26	22	26	113
1909 [2]	872	870	821	904	35	447	56		47		26	23	25	114
1910 [2]	818	816	768	875	35	414	44		52		24	23	28	109
1911 [2]	828	826	779	769	33	428	47		50		24	24	29	104
1912 [2]	862	860	810	1,051	36	457	49		53		23	21	19	117
1913 [2]	892	889	834	1,011	41	481	50		53		23	22	28	106
1914	766	763	707	[3] 870	43	410	44		45		27	23	24	75
1915	691	689	621	[4] 910	54	360	33		48		24	6	26	61
1916	662	661	598	[5] 771	49	352	33				21	6	29	50
1917	548	545	466	614	63	[6] 276	26				14	5	24	11
1918	590	588	476		91	263	[6] 30				19	5	30	11
1919	696	684	586		75	240	31	103			23	[6] 15	23	[6] 9
1920	619	616	533	368	60	194	34	74	[6] 21	33	22	13	28	10
1921	853	856	760	401	62	268	44	168	23	54	27	21	28	13
1922	864	858	716	565	103	206	38	197	25	51	22	18	26	14
1923	925	919	826	549	63	263	37	235	31	53	23	21	28	16
1924	742	738	652	679	65	226	40	144	22	45	11	21	26	16

1925 [7]	1,012	1.005	938	816	46	317	44	257	33	58	27	22	30	22
1926 [7]	812	807	747	897	41	252	30	197	31	46	23	20	24	19
1927 [7]	887	878	798	968	59	269	37	224	23	49	19	20	27	18

Bureau of Agricultural Economics. For each year is shown the production during the calendar year in the Northern Hemisphere and the succeeding harvest in the Southern Hemisphere.

1 Includes all Russian territory reporting for the years shown.
2 The average production for the 1909–1913 period as computed from figures given here for estimated world total, Northern Hemisphere total, European total and European countries whose boundaries were changed by the World War, will not agree with estimates appearing elsewhere for present territory due to changes in boundary.
3 Exclusive of the 10 Vistula Provinces of Russian Poland and the Province of Batum in Transcaucasia.
4 Exclusive of Russian Poland, Lithuania, parts of Latvia and the Ukraine, and the two Provinces of Batum and Elizabethpol in Transcaucasia.
5 Beginning with this year estimates for the present territory of the Union of Socialist Soviet Republics exclusive of Turkestan, Transcaucasia, and the Far East, which territory in 1924 produced 8,646,000 bushels.
6 Beginning with this year post-war boundaries, therefore not comparable with earlier years.
7 Preliminary.

TABLE 41.—*Rye: Monthly marketings by farmers, as reported by about 3,500 mills and elevators, United States, 1917–1926*

Year beginning July	Percentage of year's receipts												
	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Season
1917	2.8	14.8	20.5	17.1	11.3	7.6	5.8	6.4	7.6	3.4	1.7	1.0	100.0
1918	5.6	11.3	14.9	14.5	12.2	9.5	8.4	4.9	6.3	4.8	3.4	4.2	100.0
1919	8.2	15.0	13.3	12.4	7.8	9.1	8.5	4.7	6.2	6.4	4.3	4.1	100.0
1920	7.3	20.7	18.1	12.2	8.8	7.0	6.6	4.7	4.3	3.7	3.3	3.3	100.0
1921	13.9	20.8	17.6	10.6	6.3	5.9	4.5	4.8	4.9	4.0	4.2	2.5	100.0
1922	10.7	20.5	14.8	12.3	10.2	8.7	6.5	5.3	4.0	2.9	2.2	1.9	100.0
1923	5.3	18.8	19.2	14.2	9.4	8.5	5.4	5.9	3.5	2.5	3.0	4.3	100.0
1924	3.9	16.9	25.4	23.3	10.7	7.0	5.0	3.1	1.7	1.0	1.2	.8	100.0
1925	5.2	19.2	23.3	12.4	8.7	8.9	6.6	4.6	3.1	2.4	2.8	2.8	100.0
1926	8.0	20.1	19.7	13.0	8.5	6.0	6.0	6.0	3.7	2.6	3.0	3.4	100.0

Bureau of Agricultural Economics.

TABLE 42.—*Rye: Classification of cars graded by licensed inspectors, all inspection points, 1923–1926*

Year beginning July 1	Receipts						Shipments					
	1	2	3	4	Sample	Total	1	2	3	4	Sample	Total
1923–24												
Cars	14,394	13,532	3,872	1,061	473	33,332	22,068	8,481	132	89	26	30,796
Per cent	43.2	40.6	11.6	3.2	1.4	100	71.7	27.5	.4	.3	.1	100
1924–25												
Cars	27,977	24,251	8,841	2,957	876	64,902	31,838	38,210	698	131	69	70,946
Per cent	43.1	37.4	13.6	4.6	1.3	100	44.9	53.8	1.0	.2	.1	100
1925–26												
Cars	3,969	11,730	5,111	1,794	494	23,098	3,715	14,807	457	124	30	19,133
Per cent	17.2	50.8	22.1	7.8	2.1	100	19.4	77.4	2.4	.6	.2	100
1926–27												
Cars	3,892	9,921	5,794	3,597	1,445	24,649	2,695	27,053	968	446	123	31,285
Per cent	15.8	40.2	23.5	14.6	5.9	100	8.6	86.5	3.1	1.4	.4	100

Bureau of Agricultural Economics.

TABLE 43.—*Rye: Receipts at markets named, averages by groups, 1909–1925; annual, 1921–1926*

Year beginning July	Minneapolis	Duluth	Chicago	Milwaukee	Omaha	Total, 5 markets	Fort William and Port Arthur [1]
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
Average:							
1909–1913	3,579	1,039	2,213	1,950			
1914–1920	8,967	8,799	5,267	3,664			
1921–1925	9,904	25,285	5,957	2,116	1,360	44,622	6,856
1921	4,754	17,444	4,235	2,282	2,048	30,763	5,297
1922	15,111	42,744	7,585	3,241	1,916	70,597	11,552
1923	13,336	16,836	2,952	1,449	736	35,309	6,837
1924	8,447	38,496	12,586	2,733	1,207	63,469	5,265
1925	7,872	10,907	2,426	876	892	22,973	5,329
1926 [2]	4,123	13,351	2,355	1,268	941	22,038	7,844

Bureau of Agricultural Economics. Compiled from reports of Minneapolis Chamber of Commerce, Duluth Board of Trade, Chicago Board of Trade, Milwaukee Chamber of Commerce, Omaha Grain Exchange, American Elevator and Grain Trade, and Canadian Grain Statistics.

[1] Crop year begins September. [2] Beginning January, 1927, figures are subject to revision.

TABLE 44.—*Rye, including flour: International trade—average, 1910–1914; annual, 1924–1927*

Country	Average, 1910–1914		1924		1925		1926		1927, preliminary	
	Year ended June 30									
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
PRINCIPAL EXPORTING COUNTRIES	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
Algeria	(1)	--------	--------	[2] 20	(1)	[3] 43	--------	[3] 47	--------	[3] 28
Argentina	(1)	[4] 273	--------	3,092	--------	1,693	--------	1,812	--------	5,899
Bulgaria	--------	[2] 1,925	--------	[2] 129	[2] 15	34	--------	59	--------	496
Canada	65	58	21	8,596	28	5,875	23	5,768	47	8,229
Hungary	[2] 140	[2] 14,150	(1)	4,837	13	5,196	1	6,832	1	10,455
Poland	--------	--------	[2] 2	[2] 2,482	[2] 2,582	[3] 2,211	2,334	11,983	4,273	5,064
Rumania	[2] [5] 26	[2] 2,992	(1)	[3] 1,203	(1)	477	51	105	--------	--------
Russia	[2] 5,381	[2] 33,979	--------	53,331	--------	2,579	--------	7,094	--------	16,691
United States	--------	888	--------	19,902	--------	50,242	--------	12,647	--------	21,698
Yugoslavia	--------	--------	--------	[2] 14	--------	[3] 246	--------	[3] 231	--------	[3] [6] 496
PRINCIPAL IMPORTING COUNTRIES										
Austria	[2] 1,469	[2] 2	5,892	[2] 38	4,180	[2] [6] 15	4,020	[7] 162	4,277	248
Belgium	5,755	830	1,554	244	1,117	847	1,915	91	3,483	18
Czechoslovakia	--------	--------	4,827	1,760	8,730	128	8,169	102	4,299	128
Denmark	[2] 8,753	[2] 288	10,231	510	7,002	532	8,610	425	6,550	445
Estonia	--------	--------	[3] [6] 1,443	--------	[3] 1,483	--------	1,921	--------	1,944	--------
Finland	--------	--------	10,563	10	6,310	13	6,471	7	5,296	10
France	3,316	26	2,776	1,065	1,306	479	894	128	5,043	1
Germany	16,226	43,936	24,940	63	22,057	5,413	9,149	15,963	22,797	7,876
Italy	654	2	230	237	24	357	493	24	538	2
Latvia	--------	--------	[8] 2,181	[2] 1	[8] 1,981	[2] 152	[8] 2,648	[2] 66	[8] 2,043	[2] [8] 17
Netherlands	[2] 29,557	[2] 17,889	9,432	2,978	6,376	2,913	6,046	434	4,037	840
Norway	[2] 10,644	[2] [9] 51	8,097	--------	7,502	--------	7,719	--------	7,038	--------
Sweden	[2] 3,940	[2] 59	4,651	157	4,815	28	1,455	98	633	1,645
Switzerland	[2] 728	[2] 1	14	(1)	35	1	85	(1)	15	(1)
United Kingdom [10]	2,120	7	1,508	240	1,559	76	1,167	165	792	173
Total 25 countries	88,774	117,356	88,362	100,909	77,115	79,550	63,171	64,243	73,106	80,459

Bureau of Agricultural Economics.

[1] Less than 500 bushels.
[2] Year ended July 31, International Yearbook of Agricultural Statistics.
[3] International crop report and Agricultural Statistics.
[4] Average of calendar years 1909–1913.
[5] Average for the seasons 1911–12 to 1913–14.
[6] 11 months.
[7] Year ended June 30, International Yearbook of Agriculural Statistics.
[8] 10 months.
[9] Season 1913–14.
[10] Year ended Dec. 31.

TABLE 45.—*Rye: Estimated price per bushel, received by producers, United States, 1909–1927*

Year beginning July	July 15	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	Weighted av.
Average:	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1909–1913	74.7	72.4	71.7	72.0	71.7	71.3	72.1	72.2	72.0	72.4	72.8	72.9	72.1
1914–1920	129.2	127.3	126.8	125.8	124.6	125.9	129.0	131.1	135.5	142.1	143.4	139.1	129.3
1921–1925	78.5	77.8	74.3	77.1	76.9	80.7	83.9	85.4	83.0	78.4	78.6	76.9	78.8
1909	80.1	75.4	72.6	73.2	72.7	73.3	75.4	76.3	76.6	75.8	74.8	74.7	74.6
1910	74.5	74.2	73.4	72.2	71.6	72.4	73.2	72.5	73.6	75.6	76.8	77.4	73.4
1911	76.2	76.2	78.3	81.4	83.2	83.0	83.6	84.2	84.6	84.8	85.4	84.8	81.0
1912	80.8	74.4	70.4	69.4	67.6	65.0	66.4	66.0	63.0	62.6	63.2	63.6	68.7
1913	62.0	61.8	63.9	64.0	63.3	63.0	62.1	61.8	62.4	63.0	63.6	63.8	62.9
1914	62.0	68.2	77.2	79.6	83.3	88.4	95.4	103.0	102.9	101.2	100.0	95.9	83.3
1915	91.4	87.2	83.6	83.7	84.6	84.4	86.8	87.0	84.6	83.6	83.8	83.6	85.0
1916	83.4	91.6	101.9	109.7	118.7	120.3	121.0	124.8	130.8	149.8	173.6	180.0	113.0
1917	177.6	170.0	165.8	169.3	167.4	168.2	172.6	187.9	218.0	228.1	204.4	178.8	176.4
1918	166.9	161.6	156.6	153.3	152.1	151.2	145.6	136.3	139.0	150.6	149.6	141.2	152.1
1919	144.2	144.0	137.0	132.8	131.5	142.8	153.4	149.8	150.6	169.6	183.5	186.4	146.9
1920	178.8	168.8	165.6	152.2	134.4	125.8	128.1	128.8	122.4	112.0	108.8	108.0	148.2
1921	101.0	94.0	89.2	81.6	72.2	69.6	70.0	77.0	83.8	85.9	87.8	82.8	86.9
1922	74.0	66.9	63.2	65.2	68.2	70.7	71.7	71.0	70.1	70.8	69.2	62.2	68.1
1923	56.3	55.3	57.2	58.8	62.1	63.9	63.5	64.5	62.8	60.4	60.1	61.6	59.4
1924	68.8	79.8	80.1	105.7	108.6	112.7	126.2	132.2	125.1	100.9	103.6	101.8	96.3
1925	92.3	92.8	81.9	74.1	73.4	86.8	88.2	82.5	73.4	73.8	72.5	76.0	83.1
1926	80.7	86.1	81.6	82.4	83.0	82.4	83.6	88.4	86.4	85.2	90.1	94.9	84.2
1927	91.2	80.6	81.4	81.0	84.0	87.8	------	------	------	------	------	------	--------

Bureau of Agricultural Economics. Based on returns from special price reporters. Mean of prices reported on 1st of month and 1st of succeeding month, July, 1909–December, 1923.

TABLE 46.—*Rye, No. 2: Weighted average price per bushel, Chicago, 1909–1927*

Year beginning July	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Weighted av.[1]
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
Average:													
1909–1913	75	74	75	76	75	75	77	76	76	78	80	75	76
1914–1920	147	143	143	140	142	145	152	149	162	167	168	163	152
1921–1925	91	89	88	89	91	98	101	102	93	92	91	83	94
1909	79	71	72	73	74	77	81	81	79	79	77	76	76
1910	77	75	74	76	79	81	84	82	89	95	102	90	84
1911	84	85	91	97	95	93	94	92	91	94	93	83	91
1912	74	72	69	69	64	61	64	62	60	62	62	62	65
1913	63	66	67	65	64	63	61	62	61	62	65	63	64
1914	64	84	95	92	102	110	119	123	117	117	119	117	105
1915	108	100	96	101	99	97	101	97	93	96	98	98	99
1916	98	113	120	133	147	141	143	146	161	187	220	240	154
1917	227	190	186	184	178	182	201	239	284	264	220	180	211
1918	173	167	163	163	168	159	161	138	161	173	159	146	161
1919	155	154	140	138	142	166	176	156	172	199	213	227	170
1920	204	190	199	169	159	161	163	147	146	135	147	132	162
1921	127	107	104	86	79	86	81	97	102	104	106	90	97
1922	82	73	72	78	87	88	87	86	83	86	78	70	81
1923	65	67	70	72	71	70	73	72	69	66	67	76	70
1924	84	93	103	126	131	141	157	157	128	112	119	113	125
1925	97	105	90	83	88	103	105	97	85	91	86	92	96
1926	105	101	96	101	98	96	102	105	102	104	114	115	101
1927	108	97	98	100	105	109							

Bureau of Agricultural Economics. Compiled from Chicago Daily Trade Bulletin.

[1] Average of daily prices weighted by carlot sales

TABLE 47.—*Corn: Acreage, production, value, exports, etc., United States, 1849, 1859, 1866–1927*

Year	Acreage	Average yield per acre	Production	Price per bushel received by producers Dec. 1	Farm value Dec. 1	Value per acre[1]	Price per bushel at Chicago[2]	Foreign trade, including meal, year beginning July 1[3]			
								Domestic exports	Imports	Net exports	
										Total	Percentage of production
	1,000 acres	*Bush. of 56 lbs. shelled*	*1,000 bushels*	*Cents*	*1,000 dollars*	*Dollars*	*Cents*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*Per cent*
1849			*592,071*					7,633		7,633	1.3
1859			*838,793*					4,249	49	4,200	.5
1866	34,307	25.3	867,946	47.4	411,451	11.99		16,027	82	15,951	1.8
1867	32,520	23.6	768,320	57.0	437,770	13.46		12,494	50	12,446	1.6
1868	34,887	26.0	906,527	46.8	424,057	12.16		8,287	91	8,198	.9
1869			*760,945*								
1869	37,103	23.6	874,320	59.8	522,551	14.08	75	2,140	90	2,051	.2
1870	38,647	28.3	1,094,255	49.4	540,520	13.99	51	10,674	111	10,562	1.0
1871	34,091	29.1	991,898	43.4	430,356	12.62	40	35,727	59	35,668	3.6
1872	35,527	30.8	1,092,719	35.3	385,736	10.86	35	40,154	63	40,091	3.7
1873	39,197	23.8	932,274	44.2	411,961	10.51	60	35,986	76	35,910	3.9
1874	41,037	20.7	850,148	58.4	496,271	12.09	68	30,025	39	29,986	3.5
1875	44,841	29.5	1,321,069	36.7	484,675	10.81	46	50,911	53	50,858	3.8
1876	49,033	26.2	1,283,828	34.0	436,109	8.89	45	72,653	33	72,620	5.7
1877	50,369	26.7	1,342,558	34.8	467,635	9.28	40	87,192	15	87,178	6.5
1878	51,585	26.9	1,388,219	31.7	440,281	8.54	34	87,885	37	87,848	6.3
1879	*62,369*	*28.1*	*1,754,592*								
1879	62,369	29.2	1,823,163	37.1	676,251	10.84	38	99,572	66	99,507	5.5
1880	62,318	27.6	1,717,435	39.6	679,714	10.91	46	93,648	76	93,572	5.4
1881	64,262	18.6	1,194,916	63.6	759,482	11.82	67	44,341	75	44,266	3.7

[1] Based on farm price Dec. 1.

[2] Prices 1869–1898 are averages of the weekly quotations for No. 2 or better, in annual reports of Chicago Board of Trade, subsequently prices are compiled from the Chicago Daily Trade Bulletin and are the average of daily prices weighted by car-lot sales, No. 3 yellow.

[3] 1849, 1859, 1866–1917 from Commerce and Navigation of the United States; 1918, Foreign Commerce and Navigation of the United States; 1919–1926, Monthly Summary of Foreign Commerce of the United States, June issues and January and June issues, 1927. Corn—General imports 1858–1909; imports for consumption 1910–11. Corn meal—General imports 1862–1871, imports for consumption 1872–1927. Corn meal converted to terms of grain on the basis that 1 barrel is the product of 4 bushels of corn.

TABLE 47.—*Corn: Acreage, production, value, exports, etc., United States, 1849, 1859, 1866–1927*—Continued

Year	Acreage	Average yield per acre	Production	Price per bushel received by producers Dec. 1	Farm value Dec. 1	Value per acre	Price per bushel at Chicago	Foreign trade, including meal, year beginning July 1			
								Domestic exports	Imports	Net exports	
										Total	Percentage of production
	1,000 acres	*Bush. of 56 lbs. shelled*	*1,000 bushels*	*Cents*	*1,000 dollars*	*Dollars*	*Cents*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*Per cent*
1882	65, 660	24. 6	1, 617, 025	48. 5	783, 867	11. 94	55	41, 656	38	41, 617	2. 6
1883	68, 302	22. 7	1, 551, 067	42. 4	658, 051	9. 63	54	42, 259	6	46, 253	3. 0
1884	69, 684	25. 8	1, 795, 528	35. 7	640, 736	9. 19	43	52, 876	5	52, 872	2. 9
1885	73, 130	26. 5	1, 936, 176	32. 8	635, 675	8. 69	38	64, 830	20	64, 810	3. 3
1886	75, 694	22. 0	1, 665, 441	36. 6	610, 311	8. 06	38	41, 369	31	41, 337	2. 5
1887	72, 393	20. 1	1, 456, 161	44. 4	646, 107	8. 92	48	25, 361	38	25, 323	1. 7
1888	75, 673	26. 3	1, 987, 790	34. 1	677, 562	8. 95	35	70, 842	3	70, 839	3. 6
1889	*72, 088*	*29. 4*	*2, 122, 328*								
1889	72, 088	27. 7	1, 998, 648	27. 4	546, 984	7. 59	36	103, 419	2	103, 417	5. 2
1890	70, 390	20. 7	1, 460, 406	50. 0	729, 647	10. 37	58	32, 042	2	32, 039	2. 2
1891	74, 496	27. 6	2, 055, 823	39. 7	816, 917	10. 97	47	76, 602	16	76, 596	3. 7
1892	72, 610	23. 6	1, 713, 688	38. 8	664, 390	9. 15	41	47, 122	2	47, 120	2. 7
1893	74, 434	22. 9	1, 707, 572	35. 9	612, 998	8. 24	41	66, 490	3	66, 487	3. 9
1894	69, 396	19. 3	1, 339, 680	45. 1	604, 523	8. 71	44	28, 585	17	28, 569	2. 1
1895	85, 567	27. 0	2, 310, 952	25. 0	578, 408	6. 76	26	101, 100	5	101, 096	4. 4
1896	86, 560	28. 9	2, 503, 484	21. 3	532, 884	6. 16	25	178, 817	7	178, 811	7. 1
1897	88, 127	24. 3	2, 144, 553	26. 0	558, 309	6. 34	30	212, 056	4	212, 052	9. 9
1898	88, 304	25. 6	2, 261, 119	28. 4	642, 747	7. 28	34	177, 255	4	177, 252	7. 8
1899	*94, 914*	*28. 1*	*2, 666, 324*								
1899	94, 914	25. 9	2, 454, 628	29. 9	734, 916	7. 74	36	213, 123	3	213, 121	8. 7
1900	95, 042	26. 4	2, 505, 148	35. 1	878, 243	9. 24	43	181, 405	5	181, 400	7. 2
1901	94, 636	17. 0	1, 613, 528	60. 1	969, 285	10. 24	62	28, 029	19	28, 011	1. 7
1902	95, 517	27. 4	2, 619, 499	40. 1	1, 049, 791	10. 99	47	76, 639	41	76, 598	2. 9
1903	90, 661	25. 9	2, 346, 897	42. 1	987, 882	10. 90	49	58, 222	17	58, 210	2. 5
1904	93, 340	27. 1	2, 528, 662	43. 7	1, 105, 690	11. 85	48	90, 293	16	90, 278	3. 6
1905	93, 573	29. 4	2, 748, 949	40. 8	1, 120, 513	11. 97	44	119, 894	11	119, 883	4. 4
1906	93, 643	30. 9	2, 897, 662	39. 3	1, 138, 053	12. 15	50	86, 368	11	86, 358	3. 0
1907	94, 971	26. 5	2, 512, 065	50. 9	1, 277, 607	13. 45	68	55, 064	20	55, 044	2. 2
1908	95, 603	26. 6	2, 544, 957	60. 0	1, 527, 679	15. 98	65	37, 665	258	37, 437	1. 5
1909	*98, 383*	*25. 9*	*2, 552, 190*								
1909	98, 383	26. 1	2, 572, 336	58. 6	1, 507, 185	15. 32	59	38, 128	118	38, 010	1. 5
1910	104, 035	27. 7	2, 886, 260	48. 0	1, 384, 817	13. 31	53	65, 615	53	65, 562	2. 3
1911	105, 825	23. 9	2, 531, 488	61. 8	1, 565, 258	14. 79	71	41, 797	54	41, 744	1. 6
1912	107, 083	29. 2	3, 124, 746	48. 7	1, 520, 454	14. 20	53	50, 780	903	49, 913	1. 6
1913	105, 820	23. 1	2, 446, 988	69. 1	1, 692, 092	15. 99	70	10, 726	12, 368	[4] 1, 639	
1914	103, 435	25. 8	2, 672, 804	64. 4	1, 722, 070	16. 65	70	50, 668	9, 899	40, 816	1. 5
1915	106, 197	28. 2	2, 994, 793	57. 5	1, 722, 680	16. 22	79	39, 897	5, 211	34, 761	1. 2
1916	105, 296	24. 4	2, 566, 927	88. 9	2, 280, 729	21. 66	111	66, 753	2, 270	65, 092	2. 5
1917	116, 730	26. 3	3, 065, 233	127. 9	3, 920, 228	33. 58	163	49, 073	3, 197	45, 950	1. 5
1818	104, 467	24. 0	2, 502, 665	136. 5	3, 416, 240	32. 70	162	23, 019	3, 346	19, 684	. 8
1919 [5]	*87, 772*	*26. 7*	*2, 345, 833*								
1919	97, 170	28. 9	2, 811, 302	134. 5	3, 780, 597	38. 91	159	16, 729	10, 283	6, 509	. 2
1920	101, 699	31. 5	3, 208, 584	67. 0	2, 150, 332	21. 14	62	70, 906	5, 791	66, 116	2. 1
1921	103, 740	29. 6	3, 068, 569	42. 3	1, 297, 213	12. 50	55	179, 490	142	179, 374	5. 8
1922	102, 846	28. 3	2, 906, 020	65. 8	1, 910, 775	18. 58	73	96, 596	182	96, 415	3. 3
1923	101, 324	29. 3	3, 053, 557	72. 6	2, 217, 229	21. 25	88	23, 135	240	22, 896	. 7
1924 [5]	*82, 329*	*22. 2*	*1, 823, 880*								
1924	100, 863	22. 9	2, 309, 414	98. 2	2, 266, 771	22. 47	106	9, 791	4, 618	5, 348	. 2
1925	101, 359	28. 8	2, 916, 961	67. 4	1, 966, 761	19. 40	75	24, 783	637	24, 151	. 8
1926	99, 713	27. 0	2, 692, 217	64. 2	1, 729, 457	17. 34	87	19, 819	1, 160	18, 669	. 7
1927 [6]	98, 914	28. 2	2, 786, 288	72. 3	2, 014, 725	20. 37					

Bureau of Agricultural Economics. Production figures are estimates of the crop-reporting board; italic figures are census returns.

[4] Net imports.
[5] Corn harvested for grain; total acreage of corn in 1924 is 98,401,627 acres.
[6] Preliminary.

TABLE 48.—*Corn: Acreage and production, by States, average 1921–1925, annual 1925–1927*

State	Acreage				Production			
	Average, 1921–1925	1925	1926	1927 [1]	Average, 1921–1925	1925	1926	1927 [1]
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*
Maine	18	12	13	14	804	540	455	518
New Hampshire	21	14	15	15	979	700	645	615
Vermont	85	85	84	84	3, 917	4, 080	3, 612	3, 276
Massachusetts	55	43	45	46	2, 453	2, 150	1, 980	1, 886
Rhode Island	11	9	9	10	469	405	369	380
Connecticut	67	54	54	55	3, 073	2, 700	2, 268	2, 090
New York	744	691	670	663	27, 498	24, 876	23, 450	22, 542
New Jersey	220	199	188	179	9, 489	10, 348	8, 648	7, 160
Pennsylvania	1, 485	1, 408	1, 394	1, 270	65, 393	71, 808	57, 154	50, 165
Ohio	3, 736	3, 741	3, 591	3, 376	146, 588	179, 568	147, 231	109, 720
Indiana	4, 722	4, 672	4, 672	4, 205	171, 184	203, 232	177, 536	132, 458
Illinois	9, 030	9, 393	9, 205	8, 469	329, 215	394, 506	322, 175	254, 070
Michigan	1, 672	1, 642	1, 593	1, 418	59, 373	65, 680	54, 162	38, 995
Wisconsin	2, 188	2, 185	2, 119	2, 100	87, 511	101, 602	73, 106	68, 250
Minnesota	4, 165	4, 136	4, 343	4, 172	143, 116	148, 896	147, 662	127, 246
Iowa	10, 707	11, 234	11, 170	10, 947	426, 298	492. 648	435, 630	399, 506
Missouri	6, 390	6, 741	6, 471	5, 953	181, 585	198, 860	176, 011	172, 637
North Dakota	924	1, 056	1, 009	959	24, 043	24, 816	18, 162	23, 975
South Dakota	4, 257	4, 478	4, 630	4, 655	112, 350	78, 365	83, 340	134, 995
Nebraska	8, 155	9, 100	8, 994	8, 805	218, 107	236. 600	139, 407	291, 446
Kansas	5, 546	6, 623	5, 563	5, 897	111, 577	109, 942	61, 193	170, 910
Delaware	166	137	138	135	5, 440	5, 069	4, 278	4, 725
Maryland	602	554	554	515	23, 467	24, 930	22, 049	22, 660
Virginia	1, 773	1, 681	1, 694	1, 626	44, 763	36, 982	46, 585	47, 967
West Virginia	558	520	485	451	18, 510	18, 980	16, 065	15, 109
North Carolina	2, 490	2, 400	2, 376	2, 352	49, 094	44, 400	52, 272	53, 626
South Carolina	1, 860	1, 584	1, 426	1, 497	26, 841	19, 483	22, 103	25, 449
Georgia	4, 191	3, 895	3, 817	3, 893	51, 840	41, 676	55, 346	54, 502
Florida	713	580	551	573	9, 786	8, 700	7, 714	7, 449
Kentucky	3, 187	3, 231	3, 069	2, 885	85, 216	85, 622	101, 277	75, 010
Tennessee	3, 215	3, 162	3, 099	2, 944	73, 997	63, 240	85, 222	70, 656
Alabama	3, 305	2, 797	2, 825	2, 966	45, 525	37, 760	45, 765	47, 456
Mississippi	2, 514	1, 977	1, 918	1, 918	40, 653	35, 586	36, 826	34, 140
Arkansas	2, 197	2, 006	2, 026	1, 925	38, 896	28, 084	41, 533	36, 575
Louisiana	1, 516	1, 225	1, 127	1, 161	25, 030	22, 050	19, 722	20, 318
Oklahoma	2, 992	2, 558	2, 353	3, 177	49, 125	19, 185	61, 178	84, 190
Texas	4, 771	2, 957	3, 844	5, 189	90, 444	25, 134	106, 863	119, 347
Montana	320	399	359	305	6, 595	6, 584	3, 949	7, 168
Idaho	63	78	66	76	2, 382	3, 198	2, 706	3, 116
Wyoming	138	191	176	176	2, 905	4, 393	3, 520	3, 696
Colorado	1, 334	1, 467	1, 496	1, 426	21, 686	22, 005	10, 472	22, 816
New Mexico	228	175	221	166	4, 065	3, 150	4, 420	2, 490
Arizona	35	39	40	44	974	1, 014	1, 120	1, 408
Utah	23	18	18	19	560	432	432	494
Nevada	1	2	2	2	34	50	48	50
Washington	61	58	49	43	2, 273	2, 030	1, 715	1, 591
Oregon	67	71	75	81	2, 120	2, 059	2, 475	2, 916
California	105	81	77	77	3, 661	2, 843	2, 426	2, 464
United States	102, 626	101, 359	99, 713	98, 914	2, 850, 904	2, 916, 961	2, 692, 217	2, 786, 288

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

[1] Preliminary.

TABLE 49.—*Corn: Yield per acre and estimated price per bushel, December 1, by States, average 1914–1920, 1921–1925, annual 1923–1927*

State	Yield per acre							Estimated price per bushel						
	Av. 1914–1920	Av. 1921–1925	1923	1924	1925	1926	1927	Av. 1914–1920	Av. 1921–1925	1923	1924	1925	1926	1927
	Bush.	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
Maine	44.6	43.4	38.0	43.0	45.0	35.0	37.0	144	107	112	136	112	100	110
New Hampshire	44.8	47.2	42.0	48.0	50.0	43.0	41.0	136	99	111	134	100	100	105
Vermont	44.6	46.2	39.0	47.0	48.0	43.0	39.0	137	99	110	118	100	95	105
Massachusetts	46.5	45.2	43.0	45.0	50.0	44.0	41.0	138	105	115	129	110	115	120
Rhode Island	41.0	41.8	38.0	40.0	45.0	41.0	38.0	160	121	115	140	120	115	120
Connecticut	47.0	46.2	41.0	43.0	50.0	42.0	38.0	143	105	107	120	110	115	120
New York	37.3	36.8	32.4	34.0	36.0	35.0	34.0	132	93	100	117	97	86	96
New Jersey	40.5	43.0	40.0	34.0	52.0	46.0	40.0	116	81	95	116	73	80	85
Pennsylvania	41.6	43.9	40.0	36.5	51.0	41.0	39.5	114	83	91	118	80	78	91
Ohio	38.9	39.0	41.0	26.0	48.0	41.0	32.5	95	68	74	104	57	60	77
Indiana	35.9	36.1	38.5	25.6	43.5	38.0	31 5	89	61	62	94	55	50	68
Illinois	34.1	36.4	37.5	33.0	42.0	35.0	30.0	88	63	65	95	58	56	71
Michigan	31.9	35.5	34.5	28.5	40.0	34.0	27.5	109	75	78	106	75	73	85
Wisconsin	35.7	40.0	37.0	26.0	46.5	34.5	32.5	103	73	80	105	72	75	84
Minnesota	34.1	34.6	36.0	27.0	36.0	34.0	30.5	84	58	61	85	56	56	64
Iowa	37.9	39.9	40.5	28.0	43.9	39.0	36.5	83	59	62	93	56	56	69
Missouri	26.4	28.4	30.0	24.0	29.5	27.2	29.0	96	69	74	96	69	68	75
North Dakota	21.9	26.8	33.5	21.5	23.5	18.0	25.0	100	54	54	76	55	68	62
South Dakota	29.1	26.8	34.5	21.3	17.5	18.0	29.0	81	53	52	80	60	58	57
Nebraska	26.5	26.8	33.0	22.0	26.0	15.5	33.1	84	58	53	91	61	68	62
Kansas	17.3	20.3	21.7	21.7	16.6	11.0	30.0	95	62	64	87	66	70	61
Delaware	33.4	32.7	33.1	27.0	37.0	31.0	35.0	101	75	81	112	65	64	80
Maryland	37.8	38.9	39.3	31.0	45.0	39.8	44.0	102	76	82	111	70	64	80
Virginia	27.1	25.0	29.0	21.0	22.0	27.5	29.5	118	94	94	120	101	85	92
West Virginia	31.7	32.9	34.0	26.0	36.5	33.0	33.5	127	96	99	124	100	94	100
North Carolina	20.3	19.7	22.5	18.0	18.5	22.0	22.8	131	101	102	124	110	88	91
South Carolina	17.4	14.3	16.5	12.0	12.3	15.5	17.0	142	100	105	123	110	90	90
Georgia	15.0	12.3	12.2	11.5	10.7	14.5	14.0	122	92	107	112	100	76	81
Florida	15.1	13.8	12.5	13.5	15.0	14.0	13.0	109	90	100	112	100	92	97
Kentucky	27.9	26.7	28.5	25.0	26.5	33.0	26.0	102	78	85	102	81	65	88
Tennessee	25.6	23.0	24.5	21.5	20.0	27.5	24.0	104	84	94	108	89	66	83
Alabama	15.3	13.7	14.0	12.5	13.5	16.2	16.0	112	96	108	122	100	76	92
Mississippi	17.1	16.0	14.5	12.0	18 0	19.2	17.8	112	94	107	126	94	82	93
Arkansas	19.5	17.4	15.5	16.0	14.0	20.5	19.0	118	89	101	107	97	80	87
Louisiana	18.8	16.3	15.4	11.5	18.0	17.5	17.5	111	92	105	115	94	90	90
Oklahoma	17.6	16.2	11.5	19.0	7.5	26.0	26.5	99	74	87	89	90	56	50
Texas	19.9	17.6	18.5	16.0	8.5	27.8	23.0	112	91	100	110	110	60	65
Montana	18.7	21.0	26.0	18.0	16.5	11.0	23.5	113	76	65	99	95	92	72
Idaho	34.3	37.3	42.0	30.7	41.0	41.0	41.0	120	79	77	113	75	90	82
Wyoming	22.4	21.6	27.0	12.0	23.0	20.0	21.0	109	69	70	94	70	72	74
Colorado	19.4	16.1	25.0	10.0	15.0	7.0	16.0	97	64	65	88	70	71	68
New Mexico	23.3	17.6	16.4	18.0	18.0	20.0	15.0	128	95	95	110	100	87	93
Arizona	29.0	27.4	30.0	22.0	26.0	28.0	32.0	164	118	120	125	130	120	115
Utah	28.0	23.6	24.9	20.0	24.0	24.0	26.0	132	100	95	145	100	115	110
Nevada	32.3	24.2	23.3	22.4	25.0	24.0	25.0	141	118	125	121	120	120	115
Washington	34.0	36.6	37.0	30.0	35.0	35.0	37.0	127	99	95	112	95	95	90
Oregon	31.0	31.5	35.0	30.5	29.0	33.0	36.0	121	99	90	121	107	100	95
California	34.4	34.9	35.0	33.5	35.1	31.5	32.0	139	108	108	138	118	106	108
United States	27.0	27.8	29.3	22.9	28.8	27.0	28.2	96.7	69.3	72.6	98.2	67.4	64.2	72.3

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

TABLE 50.—*Corn: Acreage, yield per acre and production in specified countries, average 1909–1913, annual 1924–1927*

Country	Acreage					Yield per acre					Production				
	Average, 1909–1913 [1]	1924	1925	1926	1927, preliminary	Average 1909–1913	1924	1925	1926	1927, preliminary	Average 1909–1913 [1]	1924	1925	1926	1927, preliminary
NORTHERN HEMISPHERE															
NORTH AMERICA	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
Canada	309	295	239	210	132	56.0	40.7	44.2	37.2	33.0	17,297	11,998	10,564	7,815	4,355
United States	104,229	101,363	101,359	99,713	97,638	26.0	22.7	28.8	27.0	28.5	2,712,364	2,309,414	2,916,961	2,692,217	2,786,288
Mexico	[2] 6,093	8,072	9,244	7,484		13.5	13.2	9.7	10.9		133,362	106,345	89,803	81,768	
Guatemala	(500)	426	383	253	278		10.4	11.4	13.9	14.9	[3] 6,245	4,414	4,360	3,513	4,137
Total North American countries reporting area and production all years shown	105,038	102,584	101,981	100,176	98,048	25.6	22.7	28.7	27.0	28.5	2,735,906	2,325,826	2,931,885	2,703,545	2,794,780
Estimated North American total	111,700	111,400	112,100	108,400	106,800						2,877,000	2,444,000	3,033,000	2,796,000	2,940,000
EUROPE															
France	1,160	846	854	834	752	19.4	21.3	23.4	14.9	28.6	22,467	18,027	20,003	12,423	21,510
Spain	1,134	1,162	1,170	1,006	1,099	23.4	22.2	24.1	17.1	22.5	26,548	25,804	28,210	17,186	24,749
Portugal		800		811			13.4					10,690	11,186		
Italy	4,090	3,806	3,840	3,767	3,954	25.1	27.8	28.6	31.3	25.4	102,676	105,679	109,962	118,090	100,388
Switzerland	3	4	4	3	3	37.7	39.2	44.3	43.3	51.3	113	167	177	130	154
Austria	190	147	149	153	151	23.8	25.3	30.9	25.0	29.3	4,530	3,719	4,597	3,825	4,428
Czechoslovakia	376	389	387	388	394	22.3	26.3	31.1	26.9	26.9	8,398	10,240	12,043	10,452	10,618
Hungary	2,192	2,459	2,655	2,631	2,589	27.7	30.1	33.1	29.1	26.8	60,813	74,122	87,971	76,545	69,298
Yugoslavia	4,786	4,857	5,119	4,929	5,557	23.4	30.8	29.2	27.2	13.8	111,897	149,399	149,233	134,249	76,629
Greece	[2] 454	470				[2] 21.7	15.1				[2] 9,860	7,106	7,893		
Bulgaria	1,492	1,505	1,582	1,470	1,661	17.6	16.4	16.3	19.7	12.4	26,277	24,756	25,825	29,019	20,613
Rumania	[4] 9,644	8,949	9,713	10,031	10,427	20.0	17.4	16.9	23.9	14.0	[4] 193,209	155,461	163,739	239,496	145,475
Poland	164	190	192	195	196	17.2	21.9	18.1	21.4		2,822	4,161	3,467	4,166	
Russia, European and Asiatic	3,246	5,049	7,674	7,037		16.1	18.7	25.8	20.7		52,185	94,300	197,782	145,870	
Total European countries reporting area and production all years shown	25,067	24,124	25,473	25,212	26,587	22.2	23.5	23.6	25.4	17.8	556,928	567,364	601,760	641,415	473,862
Estimated European total excluding Russia	26,400	25,600	26,900	26,700	28,000						[5] 581,000	589,000	624,000	664,000	496,000

AFRICA															
Morocco	(438)	493	515	562	692	-	8.0	7.5	7.8	8.5	(3,500)	3,929	3,850	4,371	5,905
Algeria	34	25	26	27	-	17.6	9.7	11.1	8.2	-	598	243	288	222	-
Tunis	[6] 43	41	56	54	37	[6] 5.3	5.0	4.0	2.3	4.8	[6] 228	205	224	126	177
Egypt	[6] 1,705	1,878	2,076	-	-	[6] 37.7	36.0	37.2	-	-	[6] 64,273	67,572	77,179	76,846	-
Estimated African total	2,600	3,400	3,700	3,500	-	-	-	-	-	-	75,000	87,000	96,000	95,000	-
ASIA															
Turkey	[2] 872	661	1,001	377	-	-	-	20.6	-	-	-	-	20,606	-	-
India	[3] 5,898	5,824	5,312	5,439	-	14.0	15.0	12.7	13.8	-	[3] 82,620	87,120	67,560	74,960	-
Japanese Empire:															
Japan	133	140	137	-	-	25.5	25.5	26.1	-	-	3,391	3,565	3,573	-	-
Chosen	156	229	241	245	-	14.3	10.4	11.8	-	-	2,236	2,375	2,852	-	-
Kwantung	99	203	200	-	-	17.5	14.4	15.3	-	-	1,737	2,923	3,054	-	-
Philippines	[2] 812	1,318	1,291	-	-	9.2	13.7	13.6	-	-	[4] 7,461	18,033	17,517	-	-
Estimated Asiatic total	9,300	10,200	10,100	-	-	-	-	-	-	-	148,000	180,000	167,000	-	-
Total Northern Hemisphere countries reporting area and production all years shown	130,586	127,242	128,025	126,044	125,364	25.2	22.8	27.6	26.6	26.1	3,296,562	2,897,324	3,537,719	3,349,457	3,274,724
Estimated Northern Hemisphere total excluding Russia	150,000	150,600	152,800	148,200	148,000	-	-	-	-	-	3,681,000	3,300,000	3,920,000	3,730,000	3,658,000
SOUTHERN HEMISPHERE															
Paraguay	30	107	114	-	-	20.9	13.2	20.0	-	-	626	1,417	2,280	-	-
Brazil	(6,000)	6,178	6,301	6,919	-	-	26.2	25.8	23.8	-	(140,000)	161,731	162,412	164,336	-
Chile	56	42	58	58	-	26.0	25.7	24.3	24.3	-	1,455	1,078	1,407	1,407	-
Uruguay	589	408	436	391	-	10.4	13.2	7.6	12.6	-	6,120	5,350	3,332	4,942	-
Argentina	8,710	9,182	10,618	9,061	-	22.0	20.3	26.3	35.4	-	191,698	186,298	279,516	320,848	-
Union of South Africa	[2] 2,290	5,333	(4,604)	3,562	-	14.6	16.3	8.5	19.1	-	[4] 33,517	86,770	38,911	68,193	-
Southern Rhodesia	161	239	240	261	-	11.4	16.0	20.7	19.8	-	1,834	3,817	4,977	5,178	-
Java and Madura	(3,000)	4,356	4,847	4,840	-	14.0	15.0	16.7	16.1	-	(42,000)	65,307	80,956	77,745	-
Australia	353	399	297	-	-	23.5	31.2	25.0	-	-	10,057	12,432	7,431	-	-

[1] Where changes in boundary have occurred, the averages reported are estimates for the crop within present boundaries.
[2] 1 year only.
[3] 2-year average.
[4] 4-year average.
[5] The estimate for the 5-year period 1909-1913 given in this table is somewhat larger than the figure obtained by averaging those 5-year periods in Table 51. This is because in this table estimates for warring countries are for postwar boundaries, whereas in Table 51 they are for pre-war territory. As a result in excluding Russia, which lost territory in the war, a smaller area is excluded in this table than in Table 51.
[6] Includes some sorghum.

TABLE 50.—*Corn: Acreage, yield per acre and production in specified countries, average 1909–1913, annual 1924–1927*—Continued

Country	Acreage					Yield per acre					Production				
	Average, 1909–1913	1924	1925	1926	1927, preliminary	Average 1909–1913	1924	1925	1926	1927, preliminary	Average 1909–1913	1924	1925	1926	1927, preliminary
SOUTHERN HEMISPHERE—Continued	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
New Zealand	[4] 5	9	9	10		53.0	47.4	47.1	49.1		[4] 265	427	424	491	
Nyasaland	1	3	4	4		25.0	24.3	18.0	14.0		25	73	72	56	
Southern Hemisphere countries reporting area and production, all years shown through 1926	20,812	25,728	27,117	25,106		15.1	19.9	21.1	25.6		416,914	510,851	572,007	643,196	
Estimated Southern Hemisphere total	21,900	28,500	29,800	27,700							445,000	562,000	621,000	691,000	
Northern and Southern Hemisphere, total all countries reporting area and production all years shown through 1926	163,587	167,081	169,916	164,255		23.1	21.6	25.1	25.3		3,932,878	3,606,044	4,270,844	4,153,769	
Estimated world total excluding Russia	171,900	179,100	182,600	175,900							[5] 4,126,000	3,862,000	4,541,000	4,421,000	

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture. Figures refer to the crop harvested in the calendar year in the Northern Hemisphere and the succeeding harvest in the Southern Hemisphere.

[4] 4-year average.

[5] The estimate for the 5-year period 1909–1913 given in this table is somewhat larger than the figure obtained by averaging those 5-year periods in Table 51. This is because in this table estimates for warring countries are for postwar boundaries, whereas in Table 51 they are pre-war territory. As a result in excluding Russia, which lost territory in the war, a smaller area is excluded in this table than in Table 51.

TABLE 51.—*Corn: World production, 1900–1927*

Year	World production, excluding Russia, preliminary estimate	Total Europe, excluding Russia, preliminary estimate	Selected countries						
			United States	Italy	Rumania	Argentina	Brazil	Yugoslavia	Russia [1]
	1,000,000 bushels	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*
1900	3,582	440	2,505	88	85	99	----------	18	34
1901	2,745	497	1,614	100	117	84	----------	19	68
1902	3,683	392	2,616	71	68	149	----------	18	49
1903	3,551	459	2,347	89	80	175	----------	19	51
1904	3,502	279	2,529	91	20	141	----------	9	26
1905	3,902	404	2,749	97	59	195	----------	21	34
1906	4,088	533	2,898	93	131	72	----------	28	92
1907	3,768	441	2,512	88	58	136	----------	18	64
1908	3,830	465	2,545	96	79	177	----------	21	82
1909	3,858	499	2,572	99	70	175	----------	34	55
1910	4,060	564	2,886	102	104	28	----------	29	102
1911	3,908	501	2,531	94	111	296	----------	27	95
1912	4,451	547	3,125	99	104	197	----------	----------	94
1913	3,881	576	2,447	108	115	263	----------	----------	84
1914	4,186	562	2,673	105	103	325	----------	----------	[2] 90
1915	4,315	520	2,995	122	86	161	----------	----------	[3] 72
1916	3,710	389	2,567	82	----------	59	204	----------	[4] 62
1917	4,279	351	3,065	83	----------	171	95	----------	----------
1918	3,701	299	2,503	77	31	224	87	----------	----------
1919	4,183	454	2,811	86	[5] 141	259	197	----------	----------
1920	4,657	520	3,209	89	[5] 182	230	186	[5] 101	[4] 46
1921	4,301	393	3,069	92	[5] 111	176	181	[5] 74	[4] 46
1922	4,240	424	2,906	77	[5] 120	176	202	[5] 90	[4] 81
1923	4,490	473	3,054	89	[5] 151	277	157	[5] 85	[4] 67
1924	3,862	589	2,309	106	[5] 155	186	162	[5] 149	[5] 94
925	4,541	624	2,917	110	164	280	162	149	[5] 198
1926	4,421	664	2,692	118	239	321	164	134	[5] 146
1927 [6]	----------	----------	2,786	100	145	----------	----------	77	157

Bureau of Agricultural Economics. For each year is shown the production during the calendar year in the Northern Hemisphere and the succeeding harvest in the Southern Hemisphere.

[1] Includes all Russian territory reporting 1900–1913.
[2] Exclusive of the 10 Vistula Provinces of Russian Poland and the Province of Batum in Transcaucasia.
[3] Exclusive of Russian Poland, Lithuania, parts of Latvia and the Ukraine, and the Provinces of Batum and Elizabetpol in Transcaucasia.
[4] Estimate for the present territory of the Union of Socialist Soviet Republics, exclusive of Turkestan, Transcaucasia, and the Far East, which territory in 1924 produced 26,048,000 bushels.
[5] Production in present boundaries, therefore not comparable with earlier years.
[6] Preliminary.

TABLE 52.—*Corn: Monthly marketings by farmers, as reported by about 3,500 mills and elevators, United States, 1917–1926*

Year beginning July	Percentage of year's receipts												
	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Season
1917	5.3	4.0	3.4	3.8	8.8	12.2	14.2	16.1	13.7	7.1	5.6	5.8	100.0
1918	6.7	6.9	8.4	6.7	7.3	12.0	15.0	7.2	7.5	8.2	8.0	6.1	100.0
1919	4.5	5.6	4.9	5.6	9.2	15.0	12.9	9.5	8.7	5.9	7.6	10.6	100.0
1920	5.4	5.6	6.9	5.3	7.1	11.3	14.3	11.7	8.9	5.6	8.5	9.4	100.0
1921	4.9	7.3	8.6	6.7	6.6	12.4	13.8	12.4	7.5	4.7	7.6	7.5	100.0
1922	6.8	7.5	9.1	8.2	8.7	13.6	10.7	11.0	6.6	5.3	6.1	6.4	100.0
1923	6.8	7.2	6.1	5.6	10.4	12.3	12.9	13.3	7.4	6.1	5.9	6.0	100.0
1924	6.6	6.2	6.5	7.0	11.1	13.0	13.6	9.5	8.1	6.3	7.8	4.3	100.0
1925	5.1	7.6	5.9	5.9	9.3	14.6	12.1	10.4	8.5	5.3	7.1	8.2	100.0
1926	5.8	6.2	6.8	10.3	8.8	12.5	11.6	10.8	6.9	4.8	6.2	9.3	100.0

Bureau of Agricultural Economics.

TABLE 53.—*Corn: Farm stocks, growing conditions, quality, and shipments, United States, 1909–1927*

Year beginning November	Stocks of old corn on farms Nov. 1 [1]	Condition of new crop				Quality of new corn [2]	Proportion merchantable [1]		Stocks of corn on farms on Mar. 1 following [1]	Shipped out of county where grown [1]
		July 1	Aug. 1	Sept. 1	Oct. 1					
	1,000 bush.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*
1909	77,403	89.3	84.4	74.6	73.8	84.2	82.7	2,126,965	980,848	620,057
1910	113,919	85.4	79.3	78.2	80.3	87.2	86.4	2,492,763	1,165,378	661,777
1911	123,824	80.1	69.6	70.3	70.4	80.6	80.1	2,027,922	884,059	517,766
1912	64,764	81.5	80.0	82.1	82.2	85.5	85.0	2,654,907	1,290,642	680,831
1913	137,972	86.9	75.8	65.1	65.3	82.2	80.1	1,961,058	866,352	422,059
1914	80,046	85.8	74.8	71.7	72.9	85.1	84.5	2,259,755	910,894	498,285
1915	96,009	81.2	79.5	78.8	79.7	77.2	71.1	2,127,965	1,116,559	560,824
1916	87,908	82.0	75.3	71.3	71.5	83.8	83.9	2,154,487	782,303	450,589
1917	34,448	81.1	78.8	76.7	75.9	75.2	60.0	1,837,728	1,253,290	678,027
1918	114,678	87.1	78.5	67.4	68.6	85.6	82.4	2,062,041	855,269	362,589
1919	69,835	86.7	81.7	80.0	81.3	89.1	87.1	2,448,204	1,045,575	470,328
1920	139,083	84.6	86.7	86.4	89.1	89.6	86.9	2,789,720	1,564,832	705,481
1921	285,769	91.1	84.3	85.1	84.8	84.0	87.5	2,684,634	1,305,559	587,893
1922	177,287	85.1	85.6	78.6	78.4	85.0	88.3	2,567,044	1,093,306	518,779
1923	83,856	84.9	84.0	83.3	82.0	79.4	80.8	2,467,763	1,153,847	600,745
1924	102,429	72.0	70.7	66.4	65.3	63.2	66.0	1,523,740	757,890	417,780
1925	58,248	86.4	79.8	75.5	76.2	83.6	78.8	2,298,927	1,329,581	578,551
1926	183,015	77.9	72.5	73.8	72.4	72.6	71.1	1,913,973	1,134,370	447,102
1927 [3]	113,412	69.9	71.2	69.7	73.6	75.2				

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

[1] Based on reported percentages of entire crop on farms, proportion merchantable, and per cent shipped out of county where grown.
[2] 1909–10 to 1920–21, quality reported as per cent of a high medium grade; 1921–1927, per cent of merchantable quality.
[3] Preliminary.

TABLE 54.—*Corn: Receipts at primary markets, averages by groups, 1909–1925, annual 1921–1926*

Year beginning November	Chicago	St. Louis	Kansas City	Peoria	Omaha	Indianapolis	Total 10 markets [1]
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
Average:							
1909–1913	107,215	22,694	19,862	17,030	24,361	18,385	232,934
1914–1920	102,255	22,726	18,402	25,709	26,112	20,347	245,238
1921–1925	115,756	30,949	18,569	22,380	23,105	18,767	266,365
1921	187,884	34,055	16,031	24,960	31,115	21,291	375,409
1922	116,711	30,263	15,595	21,284	23,308	18,839	253,590
1923	101,200	39,289	21,105	17,744	27,679	17,728	274,128
1924	80,700	23,185	21,470	21,234	13,345	17,613	202,504
1925	92,283	27,952	18,643	26,678	20,076	18,363	226,192
1926 [2]	91,880	21,039	14,767	23,292	20,482	19,850	217,754

Bureau of Agricultural Economics. Compiled from reports of Chicago Board of Trade, Duluth Board of Trade, Indianapolis Board of Trade, Kansas City Board of Trade, Omaha Grain Exchange, St. Louis Merchants Exchange, Milwaukee Chamber of Commerce, Minneapolis Chamber of Commerce, and American Elevator and Grain Trade.

[1] Includes also Milwaukee, Minneapolis, Duluth, and Toledo.
[2] Beginning January, 1927, figures are subject to revision.

TABLE 55. *Shelled corn: Classification of cars graded by licensed inspectors, all inspection points*

TOTAL OF ALL CLASSES AND SUBCLASSES UNDER EACH GRADE, BY CARS, ANNUAL, 1917-1926

	Receipts								Shipments							
	1	2	3	4	5	6	Sample	Total	1	2	3	4	5	6	Sample	Total
Year beginning Nov. 1—	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
1917	2,281	18,714	58,562	56,240	45,610	44,621	98,844	324,872	510	11,589	54,975	31,687	13,037	16,141	32,218	160,157
1918	12,661	34,727	40,872	41,491	28,832	16,061	19,638	194,282	2,339	29,368	39,532	15,985	5,670	5,616	7,425	105,935
1919	28,517	47,961	38,774	56,647	27,313	9,188	13,058	221,458	5,966	39,323	30,781	15,381	4,908	2,351	3,419	102,129
1920	68,550	88,875	64,237	63,081	21,176	9,420	8,738	324,077	34,785	141,483	49,905	10,774	1,774	2,449	3,172	244,342
1921	30,970	197,254	115,207	42,850	21,963	15,979	4,951	429,204	9,854	229,539	48,887	7,270	5,321	4,992	1,436	307,299
1922	21,680	141,563	95,932	24,261	4,270	3,526	3,711	297,843	3,338	131,026	38,408	2,767	666	933	639	177,777
1923	3,038	59,578	111,899	69,352	35,901	15,404	10,741	305,913	978	59,649	79,354	15,055	3,138	2,185	2,131	162,490
1924	7,883	80,883	56,542	34,431	31,370	17,252	12,345	240,706	2,568	64,534	43,718	9,065	4,294	3,303	2,952	130,434
1925	3,358	59,985	62,757	51,092	48,348	40,116	31,473	297,129	813	60,710	55,960	12,596	5,559	6,014	4,362	146,014
1926	1,616	34,390	57,931	48,217	50,195	46,180	31,171	269,700	661	30,649	65,495	17,514	10,401	13,023	8,848	146,591

TOTAL INSPECTIONS BY GRADE AND CLASS, BY CARS, NOV. 1, 1926, TO OCT. 31, 1927

Class:																
White	235	7,810	10,939	7,772	7,815	5,970	3,880	44,421	133	6,196	8,727	1,971	537	688	460	18,712
Yellow	1,120	20,922	37,792	33,194	35,512	33,136	20,013	181,689	472	20,703	48,627	12,236	8,001	9,460	4,472	103,971
Mixed	261	5,658	9,200	7,251	6,868	7,074	7,278	43,590	56	3,750	8,141	3,307	1,863	2,875	3,916	23,908

TOTAL OF ALL CLASSES AND SUBCLASSES UNDER EACH GRADE, BY PERCENTAGE, ANNUAL, 1917-1926

Year beginning Nov. 1—	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
1917	0.7	5.8	18.0	17.3	14.1	13.7	30.4	100	0.3	7.2	34.3	19.8	8.2	10.1	20.1	100
1918	6.5	17.9	21.0	21.4	14.8	8.3	10.1	100	2.2	27.7	37.3	15.1	5.4	5.3	7.0	100
1919	12.9	21.7	17.5	25.6	12.3	4.1	5.9	100	5.8	38.5	30.1	15.1	4.8	2.3	3.4	100
1920	21.2	27.4	19.8	19.5	6.5	2.9	2.7	100	14.3	57.9	20.4	4.4	.7	1.0	1.3	100
1921	7.2	46.0	26.8	10.0	5.1	3.7	1.2	100	3.2	74.7	16.0	2.3	1.7	1.6	.5	100
1922	7.2	47.5	33.2	8.2	1.4	1.2	1.3	100	1.9	73.7	21.6	1.5	.4	.5	.4	100
1923	1.0	19.5	36.6	22.7	11.7	5.0	3.5	100	.6	36.7	48.8	9.3	1.9	1.4	1.3	100
1924	3.3	33.6	23.5	14.3	13.0	7.2	5.1	100	2.0	49.5	33.5	6.9	3.3	2.5	2.3	100
1925	1.1	20.2	21.1	17.2	16.3	13.5	10.6	100	.6	41.6	38.3	8.6	3.8	4.1	3.0	100
1926	.6	12.7	21.5	17.9	18.6	17.1	11.6	100	.5	20.9	44.7	11.9	7.1	8.9	6.0	100

TOTAL INSPECTIONS BY GRADE AND CLASS, BY PERCENTAGE, NOV. 1, 1926, TO OCT. 31, 1927

Class:																
White	.5	17.6	24.6	17.5	17.6	13.5	8.7	100	.7	33.1	46.6	10.5	2.9	3.7	2.5	100
Yellow	.6	11.5	20.8	18.3	19.6	18.2	11.0	100	.4	19.9	46.8	11.8	7.7	9.1	4.3	100
Mixed	.6	13.0	21.1	16.6	15.8	16.2	16.7	100	.2	15.7	34.1	13.8	7.8	12.0	16.4	100

TABLE 56.—*Corn, including meal in terms of grain: International trade, average 1910–1914, annual 1924–1927*

Country	Year ended June 30									
	Average, 1910–1914		1924		1925		1926		1927, preliminary	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
PRINCIPAL EXPORTING COUNTRIES	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
Argentina	[1] 2	[1] 115,749	[2] 7	128, 313	[2] 2	158, 626	[2] 2	142, 956	[2] 7	272, 373
Australia	[1] 440	[1] 10	2, 582	8	7	2, 554		[3] 55	[3] 1, 314	
British India		[1, 4] 580		1, 912		715		38		2
Bulgaria	[1] 44	[5] 9, 234		[2] 4, 183		5, 624		3, 799		5, 365
China [2]	[6] 38	[6] 148	17	852	89	545		758		983
Dutch East Indies		[1] 1, 215				[3] 3, 677		[3, 7] 736		[3, 8] 1,256
French Indo-China [3]				1, 313		1, 578		2, 374		2, 688
Hungary			108	142	116	[3] 3, 296	46	8, 752	330	2, 524
Rumania	[1, 9] 364	[1, 9] 46,998	3	39, 340	12	24, 631	21	21, 239		[3, 7] 55,923
Russia	[5] 299	[5] 28, 354		5, 288		6, 836		7, 867		[10] 9, 033
Syria and Lebanon			[2] 2	[2] 36		[3] 6		[3, 10] 26		[3, 7] 79
Union of South Africa	[1] 143	[1] 3, 952	[8] 8	[8] 21, 100	[2] 23	6, 992	[2] 20	40, 380	[2] 23	1, 430
United States	[9] 4, 441	41, 409	228	23, 135	4, 617	9, 791	635	24, 783	1, 098	19, 820
Yugoslavia [3]				[7] 2, 793		37, 713		41, 122		[8] 13, 173
PRINCIPAL IMPORTING COUNTRIES										
Algeria	[1] 231	[1] 1	80	27	390	77	65	10	600	12
Austria	[5, 11] 15,455	[5, 11] 263	2, 969		5, 500		6, 387	19	7, 946	18
Belgium	25, 818	8, 238	16, 460	503	19, 199	537	22, 588	655	26, 872	1, 502
Canada	10, 678	27	9, 249	63	7, 735	33	9, 325	62	14, 924	56
Czechoslovakia			4, 010		11, 893		13, 824	12	13, 074	2
Cuba	2, 860	([12])	3, 368		3, 461		3, 103		[13] 1, 285	
Denmark	[5] 11, 777	([12])	12, 554		20, 740		16, 198		22, 727	
Egypt	[5] 501	[5] 63	75	158	109	65	944	([12])	294	235
Estonia [3]					26		16			
Finland	[1] 260		200		101		44		148	
France	19, 793	88	21, 629	79	21, 255	99	21, 326	108	[14] 22, 134	[14] 62
Germany	32, 056	2	5, 811	14	22, 268	187	19, 679	103	57, 910	4
Greece			650		[3] 911		[3, 15] 87			
Irish Free State					15, 227	125	14, 127	92	15, 679	172
Italy	14, 829	265	10, 334	636	6, 406	708	14, 232	119	16, 134	23
Japan [3]			457		198		558		1, 511	
Latvia [3]			9		25		20		8	
Mexico	[5] 1, 120	[5, 16] 7	642	28	[13] 1, 029	[13] 2	[13] 4, 388	[13] 9		
Netherlands	[5] 30, 377	[5] 8, 641	29, 354	181	33, 367	175	38, 965	443	47, 153	736
Norway	[5, 16] 1,292		3, 606		3, 235		4, 497		5, 048	
Poland			[2] 109	[2] 1	[2] 291	[2] 99	1, 792	65	4, 235	21
Portugal	[5] 1, 833	[5] 11	[2] 1, 955		[2] 1, 942					
Spain	2, 023	49	11, 245	([12])	13, 260	1	18, 547	1	[14] 8, 823	([12])
Sweden	[5] 1, 656	[5] 26	3, 069		4, 040		3, 771		4, 652	
Switzerland	[5] 3, 984	[5] 1	4, 306	1	6, 343	([12])	5, 539	([12])	4, 832	([12])
Tunis	[5] 442	[5] 8	[3] 1		[3] 980		291	23	[14] 390	[14] 35
United Kingdom	80, 441	[1] 115	63, 466	3, 107	71, 131	3, 049	70, 914	2, 593	71, 542	2, 794
Uruguay [2]	5	201		232	103	33	97	43		[13] 2
Total, 42 countries	263, 205	265, 655	208, 563	233, 445	276, 031	267, 774	292, 048	299, 242	350, 693	390, 323

Bureau of Agricultural Economics. Official sources except where otherwise noted. Maicena or maizena is included with "Corn and corn meal."

[1] Average of years ended Dec. 31, International Yearbook of Agricultural Statistics.
[2] Year ended Dec. 31.
[3] International Crop Report and Agricultural Statistics.
[4] 2-year average.
[5] Average of years ended July 31, from International Yearbook of Agricultural Statistics.
[6] 4-year average.
[7] 8 months.
[8] 10 months.
[9] 3-year average.
[10] 11 months.
[11] The average shown for 1910–1914 is for Austria-Hungary.
[12] Less than 500 bushels.
[13] 6 months.
[14] 9 months.
[15] 2 months.
[16] 1 year only.

TABLE 57.—*Corn: Visible supply in United States,*[1] *1909–1927*

Year beginning Nov.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
Average:												
1909-1913	3,352	2,088	7,342	10.406	15,165	16,233	8,358	4,656	7,980	4,583	3,506	5,444
1914-1920	3,763	2,953	6.909	12,521	17,069	18,949	13,827	9,059	8,509	6,140	4,048	5,245
1921-1925	7,679	7,861	17,054	23,496	31,478	34,183	26,334	17,732	16.882	11,558	8,053	8,853
1909	2,653	3,289	8,465	9.764	13,480	13,778	10,603	5,940	5,146	3,770	2,750	5.011
1910	3,510	1,545	5,099	9,145	11,794	11,166	7,047	4.685	7.482	7,100	6,724	6,339
1911	1,703	2,054	5,140	6,900	14,257	15,914	7,490	5,699	8.204	2,451	1,823	3,101
1912	2,689	1,525	5,879	9,717	17,918	21,494	7,270	2,549	11,479	6,389	2,612	7,308
1913	6,206	2,026	12,126	16,505	18,374	18,812	9,380	4,409	7,589	3,203	3,923	5,461
1914	3,114	3,382	19,703	34,156	41,238	32,877	20,203	12,795	5,225	2,306	2,382	3,444
1915	3,288	4,387	8,919	14,773	24,605	27,697	21,004	14,505	6,870	5,167	3,330	5,093
1916	2,361	2,677	5,838	10,671	12,931	11,974	7,173	2,629	3,277	2,841	2,371	1,163
1917	1,277	1,932	3,155	4,623	8,939	19,016	16,111	13,038	11,487	9,466	5,232	5,503
1918	4,733	2,216	2,415	5,549	4,483	2,514	4,245	2,600	4,038	2,461	956	2,163
1919	1,484	1,477	2,921	3,575	4.951	5,669	5,035	2,740	4,364	6,152	2,564	7,587
1920	10,085	4,597	5,409	14,297	22,333	32,896	23,018	15,103	24,304	14,584	11,500	11,765
1921	18,891	15,518	23,279	30,778	44,792	46,889	35,564	27,046	29,337	19,509	7,314	12,206
1922	8,806	11,072	16,760	21,658	27,529	28,742	22,339	6,734	3,366	2,373	1,587	2,052
1923	809	2,690	8,799	9,379	18,898	26,074	17,978	12,288	8,279	4,887	5,070	7,154
1924	8,097	7,563	18,573	27,571	32,292	32,727	23,379	17,140	13,094	6,093	6,524	5,470
1925	1,790	2,461	17,861	28,092	33,878	36,485	32,408	25,453	30,333	24,930	19,771	17,381
1926	22,258	28,699	34,712	38,792	45,103	47,244	36,621	29,961	34,427	30,205	22,312	23,687
1927	20,574	19,216	------	------	------	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Compiled from the Chicago Daily Trade Bulletin. Bureau of Agricultural Economics is now securing and compiling data to replace this table as soon as enough years are covered.

[1] Saturday nearest the 1st of each month.

TABLE 58.—*Corn: Estimated price per bushel, received by producers, United States, 1909–1927*

Year beginning November	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	July 15	Aug. 15	Sept. 15	Oct. 15	Weighted av.
Average:	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1909-1913	59.4	57.7	58.9	60.1	61.3	63.4	66.2	68.4	70.0	72.1	71.7	66.7	62.8
1914-1920	100.1	98.7	101.9	105.0	109.5	116.5	123.7	127.1	130.5	130.8	122.4	107.7	110.7
1921-1925	71.7	71.8	74.0	76.5	77.4	77.1	79.6	81.6	84.9	88.8	86.6	82.7	78.1
1909	60.0	60.1	63.8	65.6	65.7	64.5	64.4	65.7	66.7	66.8	63.7	56.8	63.2
1910	50.3	48.1	48.6	49.0	49.3	50.8	53.4	57.6	62.9	65.8	65.8	65.2	53.5
1911	63.2	62.0	63.4	65.6	68.8	75.2	81.0	81.8	80.2	78.4	73.9	64.3	68.8
1912	53.6	48.8	49.8	51.4	53.0	55.2	58.7	61.9	64.3	70.4	75.4	73.0	56.7
1913	69.9	69.4	69.0	68.7	69.9	71.4	73.6	75.2	76.2	79.2	79.8	74.4	71.8
1914	67.5	65.3	69.5	74.0	75.1	76.4	77.8	77.8	78.3	78.1	73.9	66.2	71.4
1915	59.7	59.8	64.4	67.4	69.2	71.3	73.2	74.8	77.4	81.5	83.0	83.6	69.6
1916	87.0	89.4	92.9	98.4	107.2	132.0	155.4	162.4	180.6	186.0	175.3	160.6	119.0
1917	137.0	131.4	136.8	146.6	154.0	154.6	154.1	153.1	156.7	162.7	162.0	149.9	148.1
1918	138.4	140.6	141.4	137.6	143.4	156.1	166.9	173.8	183.8	188.3	169.6	143.6	153.1
1919	134.0	137.4	143.6	147.6	153.6	164.1	177.4	185.4	174.6	159.7	138.5	104.3	151.5
1920	77.2	66.8	64.6	63.4	63.8	61.2	61.0	62.4	62.0	59.0	53.6	46.0	62.1
1921	41.7	42.8	44.6	50.3	55.8	58.3	60.6	61.9	63.3	63.6	62.2	62.2	54.3
1922	64.3	67.6	70.2	72.5	75.3	79.6	84.0	85.8	87.0	87.0	86.2	84.8	76.7
1923	78.3	72.2	73.6	76.5	77.2	78.2	78.6	80.8	98.3	107.4	109.7	108.9	84.0
1924	99.6	105.6	112.0	114.5	112.1	103.8	107.5	111.0	104.4	106.5	98.8	83.0	105.8
1925	74.6	70.7	69.6	68.5	66.6	65.7	67.1	68.6	71.5	79.5	76.2	74.5	70.4
1926	66.0	64.5	64.3	66.5	65.2	65.6	73.0	88.9	92.4	97.7	95.3	87.6	73.7
1927	73.7	75.1	------	------	------	------	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Based on returns from special price reporters. Mean of prices reported on 1st of month and 1st of succeeding month, November, 1909–December, 1923.

TABLE 59.—*Corn, No. 3, yellow: Weighted average price per bushel of reported cash sales, Chicago, 1909–1927*

Year beginning November	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Weighted av.[1]
Average:	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1909–1913	60	55	56	56	57	61	64	64	65	73	71	66	61
1914–1920	115	110	111	109	114	121	130	130	134	136	124	112	115
1921–1925	79	77	79	80	79	78	81	82	89	90	87	88	79
1909	59	59	64	63	61	57	60	59	62	64	58	50	59
1910	49	45	45	45	45	50	54	55	63	65	67	73	53
1911	68	61	62	64	68	78	79	75	68	79	74	65	71
1912	52	46	46	48	49	55	57	60	62	74	75	70	53
1913	72	66	62	62	64	67	70	72	71	82	79	73	70
1914	67	64	71	74	72	75	77	74	78	81	74	65	70
1915	63	69	74	74	73	76	75	74	81	85	86	96	79
1916	98	92	98	100	109	140	159	170	199	206	210	203	111
1917	221	177	177	181	170	165	160	162	170	172	158	141	163
1918	133	145	143	127	153	162	174	178	192	195	155	141	162
1919	146	147	151	146	158	169	202	189	158	158	131	91	159
1920	77	74	65	63	62	57	60	63	60	56	53	45	62
1921	47	47	48	55	57	58	62	61	64	62	64	69	55
1922	71	73	70	72	73	79	82	84	88	88	89	104	73
1923	82	71	76	78	77	77	77	82	109	117	114	110	88
1924	111	120	124	122	117	105	115	113	108	102	91	82	106
1925	83	76	79	75	72	71	71	70	78	80	79	77	75
1926	71	75	74	73	68	71	87	99	102	109	97	84	87
1927	84	86	------	------	------	------	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Compiled from Chicago Daily Trade Bulletin. Data for 1890–1908 available in 1924 Yearbook, p. 612, Table 73.

[1] Average of daily prices weighted by car-lot sales.

TABLE 60.—*Corn: Weighted average price*[1] *per bushel of reported cash sales of all classes and grades, Chicago, and six markets combined, 1918–1927*

CHICAGO

Year beginning November	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Weighted av.[1]
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
Av. 1921–1925	74.7	74.5	74.0	75.1	74.7	75.7	80.1	80.8	88.0	89.1	86.4	87.1	79.0
1918	118.6	138.6	131.4	122.0	144.2	160.1	174.0	173.7	191.8	193.2	156.6	140.0	150.4
1919	143.8	141.6	144.9	139.5	155.1	159.7	197.4	183.3	155.3	154.9	132.2	95.9	144.1
1920	78.8	72.5	62.1	59.9	60.7	54.5	61.2	59.1	59.4	56.2	53.2	46.2	56.6
1921	46.7	47.1	47.3	54.0	57.1	58.2	61.4	60.0	63.7	62.0	63.0	69.0	56.9
1922	71.1	72.4	70.1	72.5	72.8	79.3	81.8	84.0	87.1	88.2	88.8	102.4	78.1
1923	76.1	69.8	74.4	75.2	74.4	76.4	76.7	82.6	109.1	117.2	114.9	110.0	86.0
1924	109.3	115.3	113.1	110.8	103.8	99.1	113.4	111.6	106.1	101.8	89.4	80.9	105.7
1925	70.3	67.8	69.5	63.1	65.2	65.3	67.4	65.7	74.0	76.1	75.9	73.1	68.4
1926	66.5	65.3	64.5	62.1	59.4	66.5	81.5	91.2	96.1	105.2	92.1	79.5	74.9
1927	79.8	78.9	------	------	------	------	------	------	------	------	------	------	------

SIX MARKETS COMBINED[2]

Year beginning November	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Weighted av.[1]
Av. 1921–1925	74.1	73.5	74.1	74.1	73.7	75.1	79.4	80.3	87.2	88.1	80.0	86.6	78.2
1918	122.5	140.4	133.0	123.0	143.1	160.6	172.2	173.9	189.9	191.5	156.1	139.9	150.3
1919	143.2	140.4	143.2	137.9	153.1	163.8	191.7	181.0	154.8	153.2	130.1	94.3	146.5
1920	76.5	68.6	60.3	58.1	58.8	52.9	58.9	48.3	57.5	54.0	51.9	45.2	55.5
1921	45.6	45.7	46.0	53.3	55.4	56.5	59.6	59.3	62.1	60.1	62.3	69.4	55.7
1922	70.8	71.6	69.2	71.6	72.4	79.0	82.1	83.1	85.6	86.4	88.3	100.3	77.4
1923	74.9	67.5	72.8	73.7	72.7	74.7	75.4	82.7	106.6	114.4	113.7	109.2	83.0
1924	108.3	114.4	112.9	108.6	103.5	99.0	111.9	109.7	105.3	101.3	89.1	80.8	106.0
1925	71.0	68.3	69.5	63.2	64.6	66.4	68.0	66.9	76.3	78.3	76.5	73.2	69.0
1926	67.3	65.9	65.2	62.7	60.9	67.0	83.0	91.5	96.7	104.2	92.2	79.9	75.8
1927	78.7	77.0	------	------	------	------	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Compiled from Chicago Daily Trade Bulletin, St. Louis Daily Market Reporter, Omaha Daily Price Current, Kansas City Grain Market Review, Minneapolis Daily Market Record, Cincinnati Daily Trade Bulletin. The prices in this table are comparable with prices paid to producers in that the latter are averages of the several prices reported which cover all classes and grades sold by producers.

[1] Average of daily prices weighted by car-lot sales.
[2] Markets are Chicago, St. Louis, Omaha, Kansas City, Minneapolis, and Cincinnati (not included from November, 1918, through December, 1919).

TABLE 61.—*Corn: Spot price per bushel of 56 pounds at Buenos Aires, 1912–1927*

Year beginning November	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1912	52	53	54	54	54	56	55	55	55	55	62	59	55
1913	58	58	55	56	56	54	59	55	57	[1] 56	55	49	56
1914	53	54	54	61	56	57	54	50	51	49	51	51	53
1915	54	52	56	60	56	51	45	43	45	51	55	70	53
1916	103	93	107	107	99	103	127	146	143	127	87	85	110
1917	95	88	79	79	74	59	53	57	64	68	65	63	70
1918	63	63	57	52	47	55	55	55	96	107	91	79	68
1919	74	71	70	71	83	103	113	110	96	90	92	83	88
1920	77	82	88	91	91	78	61	63	65	66	65	58	74
1921	61	63	63	73	79	77	75	71	78	78	76	74	72
1922	70	74	80	82	81	80	77	75	73	69	74	78	76
1923	81	79	78	82	77	67	65	57	68	85	93	105	78
1924	106	107	112	108	96	91	100	92	93	96	91	82	98
1925	84	86	78	73	66	70	68	68	68	70	65	60	71
1926	56	55	60	63	62	60	60	63	70	76	77	76	65
1927	75	83											

Bureau of Agricultural Economics. Compiled from International Yearbook of Agricultural Statistics, 1912-1921. Subsequently Review of the River Plate. Average of weekly quotations.

[1] Interpolation, no quotation.

TABLE 62.—*Corn, yellow, La Plata: Spot price per bushel of 56 pounds at Liverpool, 1912–1927*

Year beginning November	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1912	68	67	71	75	76	74	72	69	67	67	70	66	70
1913	63	67	65	66	68	68	74	76	78	97	93	83	75
1914	78	83	98	106	102	106	111	97	92	90	85	94	95
1915	106	119	140	144	142	143	147	133	145	154	139	148	138
1916	169	181	189	192	200	216	([1])	217	217	217	217	217	203
1917	217	217	223	223	223	223	223	223	242	261	261	261	233
1918	261	261	204	204	175	174	174	172	165	166	169	168	191
1919	165	152	[2] 149	[3] 177	[3] 196	197	181	167	153	143	160	149	166
1920	115	125	128	122	130	128	118	109	105	93	83	72	111
1921	78	88	92	108	108	103	106	101	110	110	109	108	102
1922	96	100	99	104	105	109	114	110	102	94	98	97	102
1923	96	102	103	115	111	107	112	100	94	104	114	124	107
1924	121	122	131	129	114	111	130	128	127	138	120	103	123
1925	107	110	97	91	89	94	89	87	100	98	90	93	95
1926	95	92	89	93	87	88	94	93	91	98	97	96	93
1927	97	104											

Bureau of Agricultural Economics. Compiled from International Yearbook of Agricultural Statistics, 1912-1921. Subsequently Broomhall's Corn Trade News.

[1] Not quoted. [2] Afloat price. [3] Nominal.

TABLE 63.—*Corn futures: Volume of trading in corn futures at five markets, by by crop years, 1921–1927*[1]

Market	Volume					
	1921–22	1922–23	1923–24	1924–25	1925–26	1926–27
	1,000 bush.	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*
Chicago Board of Trade	4,180,201	4,534,919	5,201,983	6,363,139	3,861,676	5,981,612
Chicago open board	78,574	109,780	147,972	124,644	96,334	158,097
Kansas City	159,604	167,939	210,241	284,576	161,079	200,701
St. Louis	37,050	57,662	51,710	52,370	18,418	24,359
Milwaukee	23,402	21,494	19,208	18,274	14,524	28,468
Total	4,478,831	4,891,794	5,631,114	6,841,003	4,153,031	6,393,837

Market	Percentage					
	1921–22	1922–23	1923–24	1924–25	1925–26	1926–27
	Per cent	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Chicago Board of Trade	93.33	92.70	92.38	93.01	93.01	93.55
Chicago open board	1.75	2.25	2.63	1.82	2.32	2.48
Kansas City	3.56	3.43	3.73	4.13	3.88	3.14
St. Louis	.83	1.18	.92	.77	.44	.38
Milwaukee	.53	.44	.34	.27	.35	.45
Total	100.00	100.00	100.00	100.00	100.00	100.00

Grain Futures Administration. No trading in corn futures at the other markets.

[1] The crop year includes trading from Nov. 1 of one year to Oct. 31 of the following year.

TABLE 64.—*Corn futures: Dealings on Chicago Board of Trade, 1921–1927*

Year	May			July		
	Amount of future transactions	Settled by delivery of warehouse certificate	Actual grain delivered	Amount of future transactions	Settled by delivery of warehouse certificate	Actual grain delivered
	1,000 bush.	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*
1921						
1922	1, 626, 666			771, 657		
1923	1, 887, 005			1, 010, 157		
1924	1, 629, 643			572, 265		
1925	3, 152, 171	6, 397	2, 738	1, 497, 403	7, 590	2, 573
1926	1, 464, 894	9, 882		615, 942	10, 646	
1927	1, 633, 726	11, 018		993, 642	7, 586	2, 503

Year	September			December		
	Amount of future transactions	Settled by delivery of warehouse certificate	Actual grain delivered	Amount of future transactions	Settled by delivery of warehouse certificate	Actual grain delivered
	1,000 bush.	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*
1921	1, 179, 337			804, 613		
1922	638, 235			1, 135, 402		
1923	722, 559			952, 758		
1924	642, 655	2, 325	741	1, 625, 889	2, 210	1, 346
1925	1, 205, 791	5, 391	1, 674	1, 255, 982	8, 749	3, 060
1926	618, 527	5, 419		1, 097, 501	3, 241	
1927	1, 491, 703			1, 847, 750		

Grain Futures Administration.

TABLE 65.—*Oats: Acreage, production, value, exports, etc., United States, 1849, 1859, 1866–1927*

Year	Acreage harvested	Average yield per acre	Production	Price per bushel received by producers Dec. 1	Farm value Dec. 1	Value per acre[1]	Price per bushel at Chicago, year beginning Aug. 1[2]	Foreign trade, including meal, year beginning July 1[3]			
								Domestic exports	Imports	Net exports[4]	
										Total	Percentage of production
	1,000 acres	*Bush. of 32 lbs.*	*1,000 bushels*	*Cents*	*1,000 dollars*	*Dollars*	*Cents*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*Per cent*
1849			*146, 584*						625	[5] 625	
1859			*172, 643*						7, 873	[5] 7, 873	
1866	8, 864	30. 2	268, 141	35. 1	94, 058	10. 61		826	790	1, 199	0. 4
1867	10, 082	27. 6	278, 698	44. 5	123, 903	12. 29		123	986	[5] 825	
1868	9, 666	26. 4	254, 961	41. 7	106, 356	11. 00		482	478	63	([6])
1869			*282, 107*								
1869	9, 461	30. 5	288, 334	38. 0	109, 522	11. 58	43	122	2, 602	[5] 2, 403	
1870	8, 792	28. 1	247, 277	39. 0	96, 444	10. 97	44	148	890	[5] 737	
1871	8, 366	30. 6	255, 743	36. 2	92, 591	11. 07	32	263	927	[5] 665	

[1] Based on farm price Dec. 1.
[2] 1869–1898 compiled from annual reports of Chicago Board of Trade; 1869–1878 are averages of the high and low for No. 2 oats as reported on the 1st and 16th of each month; 1879–1898 are averages of weekly range; 1899–1926 from Chicago Daily Trade Bulletin and are averages of the daily cash quotations of No. 3 white oats, weighted by car-lot sales.
[3] 1849, 1859, 1866–1917 compiled from Commerce and Navigation of the United States; 1918, Foreign Commerce and Navigation of the United States; 1919–1927, Monthly Summary of Foreign Commerce of the United States, June issues, and January and June issues, 1927. Domestic exports of oatmeal not reported from 1849–1884. Oats, general imports 1849–1927; oatmeal, general imports 1849–1868, and 1884–1909, imports for consumption 1869–1883 and 1910–1927.
[4] Total exports (i. e., domestic plus foreign) minus total imports.
[5] Net imports.
[6] Less than 0.05 per cent.

TABLE 65.—*Oats: Acreage, production, value, exports, etc., United States, 1849, 1859, 1866–1927*—Continued

Year	Acreage harvested	Average yield per acre	Production	Price per bushel received by producers Dec. 1	Farm value Dec. 1	Value per acre	Price per bushel at Chicago, year beginning Aug. 1	Foreign trade, including meal, year beginning July 1: Domestic exports	Imports	Net exports: Total	Net exports: Percentage of production
	1,000 acres	*Bush. of 32 lbs.*	*1,000 bushels*	*Cents*	*1,000 dollars*	*Dollars*	*Cents*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*Per cent*
1872	9,001	30.2	271,747	29.9	81,304	9.03	26	714	287	428	.2
1873	9,752	27.7	270,340	34.6	93,474	9.59	39	813	192	621	.2
1874	10,897	22.1	240,369	47.1	113,134	10.38	52	505	1,500	995	
1875	11,915	29.7	354,318	32.0	113,441	9.52	33	1,466	261	1,221	.3
1876	13,359	24.0	320,884	32.4	103,845	7.77	34	2,854	153	2,703	.8
1877	12,826	31.7	406,394	28.4	115,546	9.01	25	3,715	104	3,633	.9
1878	13,176	31.4	413,579	24.6	101,752	7.72	23	5,452	63	5,390	1.3
1879	*16,145*	*25.3*	*407,859*								
1879	16,145	27.9	450,745	33.3	150,178	9.30	29	766	537	234	.1
1880	16,188	25.8	417,885	36.0	150,244	9.28	33	403	115	290	.1
1881	16,832	24.7	416,481	46.4	193,199	11.48	45	626	1,932	[6] 1,307	
1882	18,495	26.4	488,251	37.5	182,978	9.89	38	461	885	[6] 419	
1883	20,325	28.1	571,302	32.7	187,040	9.20	30	3,275	121	3,157	.6
1884	21,301	27.4	583,628	27.7	161,528	7.58	29	6,203	94	6,109	1.0
1885	22,784	27.6	629,409	28.5	179,632	7.88	28	7,311	149	7,231	1.1
1886	23,658	26.4	624,134	29.8	186,138	7.87	26	1,375	140	1,235	.2
1887	25,921	25.4	659,618	30.4	200,700	7.74	29	573	124	455	.1
1888	26,998	26.0	701,735	27.8	195,424	7.24	24	1,191	132	1,060	.2
1889	*28,321*	*28.6*	*809,251*								
1889	28,321	28.3	801,586	21.9	175,801	6.21	22	15,107	153	14,969	1.9
1890	28,102	20.4	572,671	41.7	239,047	8.51	44	1,383	42	1,341	.2
1891	27,604	30.4	839,995	30.6	257,251	9.32	30	10,587	48	10,546	1.3
1892	28,023	24.8	695,277	31.5	218,983	7.81	30	2,701	49	2,655	.4
1893	28,452	23.8	676,151	29.1	196,437	6.90	30	6,290	32	6,258	.9
1894	28,362	25.2	715,535	32.1	229,451	8.09	28	1,709	330	1,379	.2
1895	29,379	30.2	885,959	19.4	172,198	5.86	18	15,157	67	15,117	1.7
1896	29,645	26.3	780,124	18.3	142,772	4.82	17	37,725	131	37,613	4.8
1897	28,353	27.9	791,442	20.8	164,836	5.81	23	73,880	25	73,855	9.3
1898	28,769	29.3	842,747	25.2	212,482	7.39	25	33,534	28	33,506	4.0
1899	*29,540*	*31.9*	*943,389*								
1899	29,540	31.3	925,555	24.5	226,588	7.67	24	45,049	55	44,995	4.9
1900	30,290	30.2	913,800	25.4	232,074	7.66	26	42,269	32	42,237	4.6
1901	29,894	26.0	778,392	39.7	308,796	10.33	43	13,278	39	13,240	1.7
1902	30,578	34.5	1,053,489	30.6	322,423	10.54	34	8,382	150	8,233	.8
1903	30,866	28.2	869,350	34.0	295,232	9.56	38	1,961	184	1,857	.2
1904	31,353	32.2	1,008,931	31.1	313,488	10.00	32	8,395	56	8,339	.8
1905	32,072	34.0	1,090,236	28.9	314,868	9.82	31	48,435	40	48,395	4.4
1906	33,353	31.0	1,035,576	31.9	329,853	9.89	37	6,386	91	6,379	.6
1907	33,641	23.9	805,108	44.5	358,421	10.65	50	2,519	383	2,195	.3
1908	34,006	25.0	850,540	47.3	402,010	11.82	52	2,334	6,692	[6] 4,252	
1909	*35,159*	*28.6*	*1,007,143*								
1909	35,159	30.4	1,068,289	40.6	433,869	12.34	42	2,549	1,063	1,704	.2
1910	37,548	31.6	1,186,341	34.4	408,388	10.88	33	3,846	140	3,707	.3
1911	37,763	24.4	922,298	45.0	414,663	10.98	50	2,678	2,660	30	([5])
1912	37,917	37.4	1,418,337	31.9	452,469	11.93	35	36,455	765	35,695	2.5
1913	38,399	29.2	1,121,768	39.2	439,596	11.45	40	2,749	22,333	[6] 18,858	
1914	38,442	29.7	1,141,060	43.8	499,431	12.99	50	100,609	670	100,158	8.8
1915	40,996	37.8	1,549,030	36.1	559,506	13.65	41	98,960	720	98,648	6.4
1916	41,527	30.1	1,251,837	52.4	655,928	15.80	54	95,106	841	94,348	7.5
1917	43,553	36.6	1,592,740	66.6	1,061,474	24.37	71	125,091	2,915	122,273	7.7
1918	44,349	34.7	1,538,124	70.9	1,090,322	24.59	70	109,005	838	108,167	7.0
1919	*37,991*	*27.8*	*1,055,183*								
1919	40,359	29.3	1,184,030	70.4	833,922	20.66	80	43,436	6,077	37,365	3.2
1920	42,491	35.2	1,496,281	46.0	688,311	16.20	51	9,391	3,827	5,831	.4
1921	45,495	23.7	1,078,341	30.2	325,954	7.16	35	21,237	1,824	19,422	1.8
1922	40,790	29.8	1,215,803	39.4	478,948	11.74	41	25,413	340	25,087	2.1
1923	40,981	31.9	1,305,883	41.4	541,137	13.20	45	8,796	4,271	4,550	.3
1924	*37,650*	*34.7*	*1,304,599*								
1924	42,110	35.7	1,502,529	47.7	717,189	17.03	50	16,777	3,067	13,926	.9
1925	44,872	33.2	1,487,550	38.0	565,506	12.62	41	39,687	212	39,565	2.7
1926	44,177	28.2	1,246,848	39.8	496,582	11.24	43	15,041	128	14,996	1.2
1927 [7]	42,227	28.3	1,195,006	45.0	537,276	12.72					

Bureau of Agricultural Economics. Production figures are estimates of the crop-reporting board; italic figures are census returns.

[5] Less than 0.05 [6] Net imports [7] Preliminary.

TABLE 66.—*Oats: Acreage and production, by States, average 1921–1925, annual 1925–1927*

State	Acreage				Production			
	Average, 1921–1925	1925	1926	1927 [1]	Average, 1921–1925	1925	1926	1927 [1]
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
Maine	126	135	136	129	4,870	6,075	5,168	4,773
New Hampshire	15	12	11	11	577	468	440	429
Vermont	82	84	82	83	2,944	3,360	3,116	3,237
Massachusetts	9	9	9	8	310	342	306	280
Rhode Island	1	2	3	2	43	66	96	64
Connecticut	12	13	15	15	347	429	480	480
New York	1,014	1,017	1,017	1,000	31,976	36,612	34,578	35,000
New Jersey	62	50	50	49	1,706	1,500	1,650	1,764
Pennsylvania	1,148	1,157	1,111	1,100	37,141	40,495	35,552	39,600
Ohio	1,628	2,000	1,980	1,900	55,259	83,000	75,240	60,800
Indiana	1,834	2,138	2,050	1,948	51,089	59,864	61,500	48,700
Illinois	4,309	4,855	4,661	4,008	139,045	157,788	123,516	102,204
Michigan	1,540	1,619	1,570	1,617	47,688	51,808	51,310	54,170
Wisconsin	2,566	2,603	2,577	2,422	97,506	126,246	96,638	93,247
Minnesota	4,345	4,770	4,532	4,496	159,041	200,340	129,162	120,493
Iowa	6,013	6,221	6,218	5,972	216,311	243,863	195,867	197,076
Missouri	1,656	1,923	2,173	1,630	37,482	49,998	43,460	27,710
North Dakota	2,463	2,354	2,024	2,125	67,004	63,558	34,408	45,688
South Dakota	2,604	2,834	1,984	2,480	82,450	96,356	23,213	72,664
Nebraska	2,521	2,699	2,537	2,441	69,986	73,953	52,516	69,813
Kansas	1,561	1,712	1,626	1,463	34,998	39,376	35,122	34,380
Delaware	6	4	4	4	146	100	112	116
Maryland	56	55	52	51	1,702	1,760	1,706	1,708
Virginia	173	192	186	186	3,721	4,128	4,836	3,999
West Virginia	189	188	207	224	4,520	5,076	5,796	5,421
North Carolina	241	258	310	273	4,765	4,902	6,820	5,733
South Carolina	386	378	416	449	8,557	7,182	10,483	10,327
Georgia	419	413	475	442	7,569	7,021	10,925	9,282
Florida	27	13	12	11	348	182	200	121
Kentucky	247	247	259	215	5,043	5,187	6,346	4,085
Tennessee	218	221	276	179	4,467	4,862	6,900	3,043
Alabama	224	131	107	101	4,225	2,227	2,354	1,768
Mississippi	110	85	41	48	2,082	1,615	902	912
Arkansas	270	261	243	207	5,615	4,176	5,347	4,140
Louisiana	44	30	30	35	975	630	798	612
Oklahoma	1,361	1,140	1,340	1,112	29,104	26,220	37,520	21,128
Texas	1,447	1,091	1,964	2,003	34,753	13,419	83,666	42,063
Montana	621	605	641	596	17,600	13,612	16,666	23,840
Idaho	167	170	119	143	7,125	8,330	4,760	6,721
Wyoming	146	134	120	120	4,690	4,690	4,200	4,560
Colorado	215	214	195	189	6,032	5,778	4,680	5,481
New Mexico	53	36	54	30	1,103	720	1,512	660
Arizona	16	12	15	17	492	360	525	612
Utah	72	60	54	51	2,783	2,820	2,160	2,142
Nevada	2	2	2	2	87	80	64	80
Washington	210	254	229	183	9,660	11,176	9,847	9,150
Oregon	282	320	304	310	8,862	10,560	8,816	10,540
California	138	151	156	147	4,220	5,240	5,070	4,190
United States	42,850	44,872	44,177	42,227	1,318,021	1,487,550	1,246,848	1,195,006

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[1] Preliminary.

TABLE 67.—*Oats: Yield per acre and estimated price per bushel, December 1, by States, average 1914–1920, 1921–1925, annual 1923–1927*

State	Yield per acre							Estimated price per bushel						
	Average 1914–1920	Average 1921–1925	1923	1924	1925	1926	1927	Average 1914–1920	Average 1921–1925	1923	1924	1925	1926	1927
	Bush.	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
Maine	37.4	38.6	37.0	38.0	45.0	38.0	37.0	74	56	56	65	55	63	68
New Hampshire	37.3	37.7	37.5	39.0	39.0	40.0	39.0	73	64	64	73	64	65	70
Vermont	37.0	36.0	35.0	38.0	40.0	38.0	39.0	73	61	63	69	59	60	65
Massachusetts	35.6	34.4	35.0	34.0	38.0	34.0	35.0	74	64	63	70	65	70	70
Rhode Island	31.2	30.8	32.0	30.0	33.0	32.0	32.0	74	64	60	75	65	70	75
Connecticut	31.7	29.8	29.0	29.0	33.0	32.0	32.0	73	64	62	70	61	66	69
New York	34.0	31.6	32.2	36.0	36.0	34.0	35.0	67	53	55	62	52	50	55
New Jersey	32.5	27.8	24.0	30.0	30.0	33.0	36.0	67	55	55	64	54	50	53
Pennsylvania	34.7	32.5	29.0	36.0	35.0	32.0	36.0	64	52	52	62	51	49	54
Ohio	37.8	33.4	34.5	41.0	41.5	38.0	32.0	56	43	45	52	39	39	45
Indiana	36.5	27.6	28.0	37.0	28.0	30.0	25.0	53	39	39	48	37	35	43
Illinois	39.8	32.3	35.0	39.0	32.5	26.5	25.5	54	38	39	47	35	35	43
Michigan	35.2	31.0	32.0	38.8	32.0	33.0	33.5	55	42	43	48	40	40	48
Wisconsin	39.9	38.1	36.3	40.0	48.5	37.5	38.5	55	40	43	48	38	40	47
Minnesota	34.4	36.3	37.0	43.0	42.0	28.5	26.8	49	33	34	43	31	34	40
Iowa	38.9	36.1	36.2	42.0	39.2	31.5	33.0	50	34	37	44	32	35	42
Missouri	28.4	22.4	25.0	25.0	26.0	20.0	17.0	55	43	45	51	44	42	47
North Dakota	23.9	27.2	23.0	34.0	27.0	17.0	21.5	48	28	28	36	27	33	35
South Dakota	33.7	31.6	34.0	37.0	34.0	11.7	29.3	47	30	31	40	28	36	36
Nebraska	32.4	27.8	33.0	28.0	27.4	20.7	28.6	49	34	34	43	36	40	40
Kansas	27.9	22.6	26.1	25.0	23.0	21.6	23.5	55	40	43	47	44	44	45
Delaware	30.5	26.4	26.0	30.0	25.0	28.0	29.0	70	59	60	66	65	59	68
Maryland	30.7	30.6	29.8	34.0	32.0	32.8	33.5	68	53	54	64	53	50	54
Virginia	22.2	21.5	22.0	23.5	21.5	26.0	21.5	77	64	63	72	70	63	64
West Virginia	24.9	24.0	24.0	24.0	27.0	28.0	24.2	73	62	63	73	62	59	64
North Carolina	18.5	19.6	22.0	18.0	19.0	22.0	21.0	86	74	74	84	76	69	72
South Carolina	20.1	22.1	24.0	19.5	19.0	25.2	23.0	93	84	82	97	90	67	75
Georgia	19.4	17.9	18.0	15.5	17.0	23.0	21.0	96	81	85	95	87	69	75
Florida	16.7	13.1	12.0	13.5	14.0	16.7	11.0	86	80	80	90	90	65	80
Kentucky	23.4	20.5	21.0	23.2	21.0	21.5	19.0	70	57	56	67	59	53	60
Tennessee	22.4	20.5	21.0	21.0	22.0	25.0	17.0	73	59	60	69	64	55	60
Alabama	18.8	18.2	17.0	15.0	17.0	22.0	17.5	87	77	80	87	78	68	70
Mississippi	19.2	18.6	19.0	16.0	19.0	22.0	19.0	85	74	76	85	78	66	70
Arkansas	24.6	20.8	23.0	18.0	16.0	22.0	20.0	72	57	62	64	58	52	58
Louisiana	22.8	21.7	22.0	20.0	21.0	26.6	17.5	80	74	68	83	80	64	66
Oklahoma	25.6	21.6	20.0	25.0	23.0	28.0	19.0	58	46	52	53	51	37	44
Texas	27.7	23.9	32.0	34.0	12.3	42.6	21.0	65	55	57	59	63	38	47
Montana	29.0	28.2	33.0	29.5	22.5	26.0	40.0	60	42	38	47	53	53	44
Idaho	40.0	42.4	46.0	36.0	49.0	40.0	47.0	66	45	44	58	43	45	50
Wyoming	34.1	32.0	34.0	30.0	35.0	35.0	38.0	69	46	47	58	46	45	42
Colorado	34.0	28.0	32.0	25.0	27.0	24.0	29.0	65	40	46	58	50	44	48
New Mexico	30.8	20.7	20.0	20.0	20.0	28.0	22.0	73	60	70	60	64	56	56
Arizona	36.9	30.8	30.0	28.0	30.0	35.0	36.0	89	74	80	81	75	75	70
Utah	41.6	38.6	37.8	32.8	47.0	40.0	42.0	73	55	58	70	62	60	60
Nevada	40.1	36.1	35.4	30.0	40.0	32.0	40.0	88	74	81	72	65	62	65
Washington	43.0	45.7	57.0	38.5	44.0	43.0	50.0	68	52	50	59	52	53	56
Oregon	35.0	31.4	39.0	28.0	33.0	29.0	34.0	66	50	45	61	51	50	53
California	32.4	29.5	32.5	18.2	34.7	32.5	28.5	76	65	60	87	61	48	63
United States	33.3	30.9	31.9	35.7	33.2	28.2	28.3	55.3	39.3	41.4	47.7	38.0	39.8	45.0

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TABLE 68.—*Oats: Acreage, yield per acre, and production in specified countries, average 1909–1913, annual 1924–1927*

Country	Acreage					Yield per acre					Production				
	1909–1913 [1]	1924	1925	1926	1927, preliminary	1909–1913 [1]	1924	1925	1926	1927, preliminary	1909–1913	1924	1925	1926	1927, preliminary
NORTHERN HEMISPHERE															
NORTH AMERICA	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
Canada	9,597	14,491	14,672	12,741	13,240	36.6	28.0	35.0	30.1	34.2	351,690	405,976	513,384	383,419	452,421
United States	37,357	42,110	44,372	44,303	42,914	30.6	35.7	33.2	28.1	27.8	1,143,407	1,502,529	1,487,550	1,246,848	1,195,006
Total	46,954	56,601	59,544	57,044	56,154	31.8	33.7	33.6	28.6	29.3	1,495,097	1,908,505	2,000,934	1,630,267	1,647,427
EUROPE															
United Kingdom:															
England and Wales	2,039	2,038	1,868	1,863	1,751	47.5	51.5	51.7	56.0	53.7	96,913	104,930	96,600	104,324	94,059
Scotland	952	956	926	940	897	46.8	51.3	54.1	55.9	48.4	44,507	49,070	50,120	52,500	43,400
Ireland	1,049	1,022	993	968	954	62.1	51.4	60.6	67.4	......	65,169	52,502	60,158	65,202	......
Norway	264	230	241	241	240	38.9	46.3	50.0	55.3	50.7	10,276	10,641	12,048	13,332	12,169
Sweden	1,961	1,909	1,803	1,824	1,803	43.9	37.3	44.9	47.2	42.9	86,050	71,145	81,009	86,057	77,416
Denmark	1,161	1,141	1,100	1,048	1,087	52.2	55.4	59.9	57.6	55.1	60,557	63,208	65,837	60,333	59,938
Netherlands	346	377	366	380	366	52.2	55.4	55.5	59.3	62.5	18,070	20,881	20,314	22,530	22,873
Belgium	668	653	654	668	657	65.8	67.7	65.0	75.9	67.0	43,964	44,207	42,502	50,729	43,991
Luxemburg	77	73	71	71	71	43.9	29.6	35.8	45.8	39.0	3,382	2,162	2,545	3,249	2,768
France	10,084	8,636	8,598	8,677	8,542	36.5	35.4	38.1	42.0	43.6	368,462	305,535	327,645	364,120	372,537
Spain	1,276	1,635	1,798	1,863	1,883	22.8	17.6	24.2	20.2	21.2	29,110	28,792	43,444	37,688	39,928
Portugal	(600)	564	......	500	......	......	11.2	......	9.5	......	(7,000)	6,303	5,684	4,728	6,412
Italy	1,276	1,106	1,202	1,231	1,203	29.4	30.1	39.3	33.0	25.5	37,537	33,296	47,199	40,647	30,720
Switzerland	81	50	49	51	51	59.1	53.9	55.0	60.9	60.0	4,784	2,694	2,694	3,107	3,059
Germany	9,529	8,710	8,530	8,590	8,624	55.3	44.7	45.1	50.7	50.7	527,178	389,525	384,737	435,725	437,269
Austria	883	763	760	777	771	32.9	29.9	35.2	38.6	37.3	29,030	22,843	26,761	29,955	28,747
Czechoslovakia	2,506	2,090	2,068	2,083	2,113	38.4	39.7	43.5	45.6	42.9	96,147	82,959	89,863	95,066	90,742
Hungary	849	708	717	680	636	33.5	22.2	35.6	36.5	34.1	28,464	15,713	25,532	24,802	21,717
Yugoslavia	1,358	871	856	871	983	24.7	23.9	27.8	28.3	20.2	33,516	20,795	23,772	24,645	19,424
Greece	[2] 140	......	......	271	280	[2] 29.1	......	......	20.5	17.8	[2] 4,075	2,576	5,688	5,556	4,972
Bulgaria	408	376	357	319	321	21.2	16.9	21.5	23.2	23.3	8,651	6,371	7,691	7,415	7,481
Rumania	[3] 2,119	3,056	2,928	2,665	2,680	[3] 28.2	13.7	17.4	30.0	21.9	[3] 59,776	42,013	50,986	79,850	58,688
Poland	6,666	6,388	6,369	6,437	6,499	29.4	26.0	35.8	32.6	35.9	195,825	166,169	228,145	210,110	233,551
Lithuania	961	803	852	943	766	23.8	23.1	24.5	23.3	24.3	22,910	18,584	20,849	22,008	18,584
Latvia	765	826	814	793	754	25.1	22.6	25.7	24.0	16.2	19,188	18,669	20,935	19,009	12,194
Estonia	394	410	371	362	360	24.9	23.6	23.5	25.3	37.2	9,795	9,677	8,723	9,170	13,406
Finland	999	1,049	1,072	1,090	1,095	20.4	32.3	37.7	37.5	33.9	20,391	33,913	40,410	40,835	37,113
Russia, European	35,514	25,368	25,925	30,158	......	23.0	16.6	22.9	25.3	......	817,231	421,580	593,868	762,552	......
Total European countries reporting area and production all years shown	47,622	44,854	44,370	44,467	44,133	38.9	34.9	38.8	41.3	40.4	1,854,483	1,563,792	1,720,361	1,837,206	1,781,774
Estimated European total, excluding Russia	49,400	46,600	46,100	46,200	45,900	......	......	......	......	......	[4] 1,931,000	1,625,000	1,792,000	1,913,000	1,853,000

AFRICA															
Morocco	25	49	45	56	54	20.0	22.2	21.9	11.2	38.3	(500)	1,089	985	626	2,067
Algeria	449	622	635	621	580	30.0	14.7	24.8	14.9	17.9	13,489	9,137	15,768	8,693	10,403
Tunis	133	112	100	99	94	27.4	14.2	27.6	21.6	20.9	3,642	1,585	2,756	2,136	1,963
Total	607	783	780	776	728	29.0	15.1	25.0	14.8	19.8	17,631	11,811	19,509	11,455	14,433
ASIA															
Cyprus	----	17	15	18	----	----	14.7	19.7	17.3	----	515	250	296	311	----
Turkey	[3] 380	191	221	222	----	[2] 56.7	----	51.5	----	----	[2] 21,562	----	11,391	----	----
Russia, Asiatic	5,742	3,588	4,471	5,392	----	18.8	24.4	24.6	26.1	----	107,687	87,505	[5] 109,767	[5] 140,945	----
Syria and Lebanon	----	32	24	62	66	----	13.9	19.3	23.0	18.4	175	444	463	1,481	1,215
Japanese Empire:															
Japan	110	274	265	269	----	44.8	36.2	40.5	40.0	----	4,928	9,932	10,744	10,764	----
Chosen	141	286	268	277	----	15.6	14.9	13.4	15.5	----	2,202	4,249	3,592	4,296	----
Total Northern Hemisphere countries reporting area and production all years shown	95,183	102,238	104,694	102,287	101,015	35.4	34.1	35.7	34.0	34.1	3,367,211	3,484,108	3,740,804	3,478,928	3,443,634
Estimated Northern Hemisphere total excluding Russia and China	97,700	104,900	107,300	104,900	103,700	----	----	----	----	----	[4] 3,474,000	3,574,000	3,840,000	3,584,000	3,543,000
SOUTHERN HEMISPHERE															
Brazil	----	15	15	14	----	----	29.3	24.8	23.0	----	----	440	372	322	----
Chile	78	133	143	97	----	42.7	34.3	38.7	42.7	----	3,333	4,558	5,536	4,139	----
Uruguay	66	138	149	101	97	19.5	23.0	16.4	14.2	----	1,285	3,168	2,440	1,435	----
Argentina	2,396	2,646	3,194	3,171	3,160	22.6	20.2	25.2	20.9	20.5	54,246	53,456	80,432	66,276	64,760
Union of South Africa	809	635	----	----	----	11.9	11.8	----	----	----	9,661	7,469	6,386	9,931	10,954
Australia	745	1,165	1,013	----	----	23.8	16.6	21.8	----	----	17,768	19,394	12,212	14,870	----
New Zealand	366	147	102	117	----	49.1	48.5	49.2	51.2	----	17,978	7,134	5,016	5,987	----
Total Northern and Southern Hemisphere countries reporting area and production all years shown	97,579	104,884	107,888	105,458	104,175	35.1	33.7	35.4	33.6	33.7	3,421,457	3,537,564	3,821,236	3,545,204	3,508,394
Estimated world total excluding Russia and China	102,200	109,800	112,600	110,200	108,900	----	----	----	----	----	[4] 3,581,000	3,673,000	3,957,000	3,691,000	3,651,000

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture. Figures given are for crops harvested during the calendar year in the Northern Hemisphere and the succeeding harvest in the Southern Hemisphere.

[1] Where changes in boundary have occurred the averages are estimates for territory within present boundaries.

[2] 1 year only.

[3] 4-year average.

[4] The estimate for the 5-year period 1909–1913 given in this table is somewhat larger than the figure obtained by averaging the same 5 years in Table 69. This is because in this table estimates for warring countries are for postwar boundaries, whereas in Table 69 they are for pre-war territory. As a result, in excluding Russia, which lost territory in the war, a smaller area is excluded in this table than in Table 69.

[5] Estimates for all Russia distributed between European and Asiatic territory in the same ratio as the 1925 preliminary estimate.

TABLE 69.—*Oats: World production, 1894–1927*

Year	World production excluding Russia, preliminary estimate	European total excluding Russia, preliminary estimate	Selected countries							
			United States	Russia [1]	Germany	France	Canada	Poland	England and Wales	Argentina
	1,000,000 bushels	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*
1894	2,303	1,451	716	744	453	294	---	---	119	---
1895	2,503	1,432	886	717	430	306	---	---	105	---
1896	2,320	1,376	780	800	411	296	---	---	93	---
1897	2,232	1,282	791	664	394	253	---	---	99	1
1898	2,501	1,511	843	688	465	322	---	---	102	1
1899	2,633	1,462	926	995	474	308	---	---	99	2
1900	2,624	1,454	914	854	489	285	---	---	99	2
1901	2,344	1,415	778	624	486	255	---	---	91	2
1902	2,888	1,576	1,053	931	514	320	---	---	115	4
1903	2,829	1,649	869	800	542	344	---	---	109	3
1904	2,716	1,435	1,009	1,124	478	291	---	---	112	4
1905	2,823	1,460	1,090	937	451	306	---	---	99	6
1906	3,673	1,683	1,036	714	581	295	---	---	109	12
1907	2,861	1,768	805	921	630	353	---	---	121	34
1908	2,832	1,632	851	959	530	327	250	---	106	32
1909	3,415	1,863	1,068	1,163	629	383	353	---	104	36
1910	3,223	1,660	1,186	1,065	544	332	244	---	104	47
1911	3,135	1,683	922	876	531	349	365	---	96	69
1912	3,700	1,720	1,418	1,089	587	355	392	---	89	76
1913	3,580	1,909	1,122	1,251	669	357	405	---	91	43
1914	3,266	1,681	1,141	[2] 915	623	318	313	---	93	49
1915	3,594	1,401	1,549	[3] 897	412	339	465	---	101	75
1916	3,259	1,469	1,252	[4] 845	484	277	410	---	102	32
1917	3,217	1,047	1,593	761	[5] 250	[5] 220	403	---	106	69
1918	3,215	1,117	1,538	---	302	181	426	---	140	34
1919	3,040	1,319	1,184	---	310	180	394	76	111	31
1920	3,647	1,478	1,496	486	332	291	531	129	105	51
1921	3,137	1,511	1,078	359	345	244	426	150	98	31
1922	3,385	1,546	1,216	409	277	288	491	176	91	56
1923	3,852	1,812	1,306	405	421	337	564	243	93	76
1924	3,673	1,625	1,503	[5] 509	390	306	406	166	105	53
1925	3,957	1,792	1,488	[5] 704	385	328	513	228	97	80
1926	3,691	1,913	1,247	[5] 903	436	364	383	210	104	60
1927 [6]	3,651	1,853	1,195	896	437	373	452	236	94	65

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture. For each year is shown the production during the calendar year in the Northern Hemisphere and the succeeding harvest in the Southern Hemisphere.

[1] Includes all Russian territory reporting for the years shown.
[2] Total Russian Empire exclusive of the 10 Vistula Provinces of Russian Poland and the Province of Batum in Transcaucasia.
[3] Exclusive of Russian Poland, Lithuania, parts of Latvia and the Ukraine and the Provinces of Batum and Elizabetpol, in Transcaucasia.
[4] Beginning this year estimate for the present territory of the Union of Socialist Soviet Republics exclusive of Turkestan, Transcaucasia, and the Far East, which territory in 1924 produced 20,248,000 bushels.
[5] Beginning with this year postwar boundaries and therefore not comparable with earlier years.
[6] Preliminary.

TABLE 70.—*Oats: Monthly marketings by farmers, as reported by about 3,500 mills and elevators, United States, 1917–1926*

Year beginning July	Percentage of year's receipts												
	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Season
1917	4.7	16.4	13.5	11.1	7.7	7.8	8.3	8.0	7.1	6.5	4.0	4.9	100.0
1918	8.0	19.6	11.9	9.9	7.2	6.7	6.7	4.5	5.5	6.3	7.0	6.7	100.0
1919	14.4	18.4	10.1	9.2	5.8	8.3	8.2	6.6	4.9	4.3	5.2	4.6	100.0
1920	8.3	18.7	13.8	9.5	5.5	5.8	6.6	6.6	6.0	4.6	6.8	7.8	100.0
1921	15.1	16.5	11.8	7.9	5.3	6.1	7.3	6.9	5.6	4.3	7.2	6.0	100.0
1922	8.9	15.7	11.9	10.1	7.8	8.6	7.4	7.1	6.5	4.7	5.4	5.9	100.0
1923	7.0	17.7	14.1	11.5	6.8	7.6	7.7	7.9	5.2	4.8	4.8	4.9	100.0
1924	14.0	20.7	17.8	11.5	5.6	4.8	4.7	3.5	3.9	3.9	5.0	4.6	100.0
1925	10.4	22.4	13.1	9.3	6.3	6.8	6.1	6.2	5.1	4.2	4.5	5.6	100.0
1926	10.7	21.9	11.7	8.5	5.5	6.4	6.1	6.8	5.7	4.5	5.6	6.6	100.0

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TABLE 71.—*Oats: Farm stocks, growing conditions, quality, and shipments, United States, 1909–1927*

Year beginning August	Stocks of old oats on farms Aug. 1 [1]	Conditions of new crop				Weight per measured bushel of new oats [2]	Quality of new oats [3]	Stocks of oats on farms on Mar. 1 following [1]	Shipped out of county where grown [1]
		June 1	July 1	Aug. 1	Sept. 1				
	1,000 bush.	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Pounds*	*Per cent*	*1,000 bush.*	*1,000 bush.*
1909	27,478	88.7	88.3	85.5	83.8	32.7	91.4	385,705	343,968
1910	66,666	91.0	82.2	81.5	83.3	32.7	93.8	442,665	363,103
1911	67,801	85.7	68.8	65.7	64.5	31.1	84.6	289,989	265,944
1912	34,875	91.1	89.2	90.3	92.3	33.0	91.0	604,249	433,130
1913	103,916	87.0	76.3	73.8	74.0	32.1	89.1	419,481	297,365
1914	62,467	89.5	84.7	79.4	75.8	31.5	86.5	379,369	335,539
1915	55,607	92.2	93.9	91.6	91.1	33.0	87.5	598,148	465,823
1916	113,728	86.9	86.3	81.5	78.0	31.2	88.2	394,211	355,092
1917	47,834	88.8	89.4	87.2	90.4	33.4	95.1	599,208	514,117
1918	81,424	93.2	85.5	82.8	84.4	33.2	93.6	590,251	421,568
1919	93,045	93.2	87.0	76.5	73.0	31.1	84.7	409,730	312,364
1920	54,819	87.8	84.7	87.2	88.3	33.1	93.3	683,759	431,687
1921	161,108	85.7	77.6	64.5	61.1	28.3	74.7	411,934	258,259
1922	74,513	85.5	74.4	75.6	74.9	32.0	87.7	421,118	303,950
1923	70,965	85.6	83.5	81.9	80.3	32.1	87.9	447,366	322,971
1924	65,710	83.0	86.9	88.2	89.3	33.4	91.4	538,832	422,112
1925	90,179	79.6	76.3	79.1	82.1	32.9	91.7	571,248	364,407
1926	107,917	78.8	74.5	71.4	67.9	30.9	78.9	421,897	272,804
1927 [4]	61,237	79.9	79.9	74.8	70.3	30.4	80.3	----------	----------

Bureau of Agricultural Economics.

[1] Based on percentage of crop as reported by crop reporters.
[2] Average weight per measured bushel as reported by crop reporters.
[3] Per cent of a "high medium grade" as reported by crop reporters.
[4] Preliminary.

TABLE 72.—*Oats: Receipts at primary markets, averages by groups, 1909–1925, annual 1921–1926*

Year beginning August	Chicago	Milwaukee	Minneapolis	St. Louis	Peoria	Omaha	Total, 10 markets [1]
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
Average:							
1909–1913	107,484	14,044	17,313	22,457	10,329	12,330	208,920
1914–1920	121,551	30,540	31,722	27,601	12,366	15,730	273,759
1921–1925	71,694	20,319	35,908	31,711	12,750	14,676	225,815
1921	78,042	23,612	33,072	26,118	13,485	10,964	215,715
1922	85,169	22,780	25,706	33,261	15,947	14,886	224,104
1923	69,902	20,496	29,259	35,791	13,406	18,385	219,972
1924	74,698	20,542	54,886	34,724	11,164	16,023	261,562
1925	50,660	14,165	36,616	28,602	9,749	13,124	207,723
1926 [2]	49,420	14,857	18,170	19,746	8,256	6,636	140,044

Bureau of Agricultural Economics. Compiled from reports of Chicago Board of Trade, Duluth Board of Trade, Indianapolis Board of Trade, Kansas City Board of Trade, Omaha Grain Exchange, St. Louis Merchants Exchange, Milwaukee Chamber of Commerce, Minneapolis Chamber of Commerce, and American Elevator and Grain Trade.

[1] Includes also Duluth, Toledo, Kansas City, and Indianapolis.
[2] Beginning January, 1927, figures are subject to revision.

TABLE 73.—*Oats: Classification of cars graded by licensed inspectors, all inspection points*

TOTAL OF ALL CLASSES AND SUBCLASSES UNDER EACH GRADE, BY CARS, ANNUAL, 1919–1926

Year beginning Aug. 1—	Receipts						Shipments					
	1	2	3	4	Sample	Total	1	2	3	4	Sample	Total
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
1919	5,662	52,094	96,039	15,887	3,589	173,271	3,167	41,094	62,764	4,100	692	111,817
1920	8,803	60,169	73,072	14,766	6,831	163,641	3,600	45,099	31,811	2,821	2,220	85,551
1921	2,519	31,643	105,103	31,774	6,664	177,703	2,384	49,117	72,955	4,305	1,675	130,436
1922	2,548	47,347	95,984	17,004	4,640	167,523	1,738	45,563	62,601	6,112	1,235	117,249
1923	2,724	41,530	90,759	22,643	11,307	168,963	1,263	34,056	49,152	6,659	2,620	93,750
1924	1,489	33,631	110,377	24,580	14,853	184,930	601	31,348	70,439	8,874	5,978	117,240
1925	2,197	53,585	75,633	17,989	6,260	155,664	1,376	47,866	54,689	4,332	2,861	111,124
1926	1,465	19,692	49,581	28,548	17,695	116,981	986	20,470	45,846	10,959	5,288	83,549

TABLE 73.—*Oats: Classification of cars graded by licensed inspectors, all inspection points*—Continued

TOTAL INSPECTIONS BY GRADE AND CLASS, BY CARS, AUG. 1, 1926, TO JULY 31, 1927

Year beginning Aug. 1—	Receipts						Shipments					
	1	2	3	4	Sample	Total	1	2	3	4	Sample	Total
Class:	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
White	500	12,278	44,970	26,967	17,059	101,774	480	16,730	44,593	10,767	5,134	77,704
Red	787	6,814	4,181	1,260	288	13,330	488	3,555	1,193	149	22	5,407
Gray	41	98	69	32	14	254	0	2	0	0	0	2
Black	0	0	0	0	0	0	0	0	0	0	0	0
Mixed	137	502	361	289	334	1,623	18	183	60	43	132	436

TOTAL OF ALL CLASSES AND SUBCLASSES UNDER EACH GRADE, BY PERCENTAGES, ANNUAL, 1919–1926

	P. ct.	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct.*	*P. ct*	*P. ct.*	*P. ct*	*P. ct.*
1919	3 3	30.0	55.4	9.2	2.1	100	2.8	36.8	56.1	3.7	0.6	100
1920	5.4	36.8	44.6	9.0	4.2	100	4.2	52.7	37.2	3.3	2.6	100
1921	1.4	17.8	59.1	17.9	3.8	100	1.8	37.7	55.9	3.3	1.3	100
1922	1.5	28.3	57.3	10.1	2.8	100	1.5	38.9	53.4	5.2	1.0	100
1923	1.6	24.6	53.7	13.4	6.7	100	1.4	36.3	52.4	7.1	2.8	100
1924	0.8	18.2	59.7	13.3	8.0	100	0.5	26.7	60.1	7.6	5.1	100
1925	1.4	34.4	48.6	11.6	4.0	100	1.2	43.1	49.2	3.9	2.6	100
1926	1.3	16.8	42.4	24.4	15.1	100	1.2	24.5	54.9	13.1	6.3	100

TOTAL INSPECTIONS BY GRADE AND CLASS, BY PERCENTAGES, AUG. 1, 1926, TO JULY 31, 1927

Class:												
White	.5	12.1	44.2	26.5	16.7	100	.6	21.5	57.5	13.8	6.6	100
Red	5.9	15.1	31.4	9.4	2.2	100	9.0	65.7	22.1	2.8	.4	100
Gray	16.1	38.6	27.2	12.6	5.5	100	0	100.0	0	0	0	100
Black	0	0	0	0	0	0	0	0	0	0	0	0
Mixed	8.4	30.9	22.3	17.8	20.6	100	4.1	42.0	13.8	9.8	30.3	100

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TABLE 74.—*Oats: Visible supply in United States,*[1] *1909–1927*

Year beginning August	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July
	1,000 bush.	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*
Average:												
1909–1913	7,185	13,460	18,525	19,024	17,969	16,286	14,857	14,521	13,869	10,748	7,866	7,894
1914–1920	7,879	14,984	23,791	26,613	28,498	28,660	26,513	25,203	23,404	20,717	17,141	13,698
1921–1925	21,818	34,206	47,372	51,211	50,468	51,075	50,611	49,063	43,706	36,706	28,498	25,539
1909	3,800	5,183	12,799	13,264	13,586	11,180	8,759	8,639	9,916	9,223	6,905	4,245
1910	2,761	12,551	18,802	17,022	15,505	16,129	15,997	15,769	13,129	10,559	8,125	9,570
1911	11,203	20,742	21,044	22,600	20,315	18,754	15,431	14,366	13,429	11,991	8,052	3,690
1912	1,031	4,160	9,260	10,552	10,774	8,457	9,646	12,343	13,115	8,704	8,105	14,756
1913	17,131	24,662	30,718	31,684	29,664	26,909	24,450	21,489	19,755	13,262	8,144	7,210
1914	6,482	20,124	27,285	31,866	32,471	32,956	33,173	33,258	27,284	23,022	12,623	4,345
1915	1,309	2,924	14,381	15,730	20,928	21,081	20,175	20,265	17,892	12,096	16,192	12,452
1916	8,537	27,691	38,866	45,580	47,467	48,823	42,675	36,740	34,191	28,933	17,454	9,741
1917	6,679	7,277	14,165	17,453	18,595	17,657	13,879	13,947	18,098	21,911	20,822	13,227
1918	7,876	19,309	24,689	22,050	29,143	34,828	30,505	27,666	22,882	21,507	15,827	18,094
1919	20,481	19,411	19,552	19,196	16,922	13,080	11,550	10,401	9,576	6,813	8,642	3,623
1920	3,786	8,149	27,602	34,414	33,961	32,194	33,632	34,142	33,903	30,740	28,426	34,401
1921	37,562	60,455	65,843	69,998	69,198	67,728	68,010	68,529	64,644	55,837	47,950	42,743
1922	36,667	38,355	35,968	34,077	32,940	32,391	30,861	27,683	24,044	21,932	13,514	8,523
1923	5,477	10,111	16,514	20,488	18,686	19,940	17,539	17,741	16,715	10,656	6,720	5,264
1924	3,086	11,403	52,715	66,564	67,265	72,128	73,570	72,386	61,104	48,082	35,331	33,263
1925	26,298	50,706	65,818	64,926	64,251	63,187	63,076	58,974	52,023	47,025	38,976	37,900
1926	33,772	43,671	48,450	48,097	48,288	44,927	45,422	43,454	37,145	29,573	20,502	17,790
1927	12,001	21,501	24,931	23,857	23,252							

Bureau of Agricultural Economics. Compiled from the Chicago Daily Trade Bulletin. Bureau of Agricultural Economics is now securing and compiling data to replace this table as soon as enough years are covered.

[1] Saturday nearest the 1st of each month.

TABLE 75.—*Oats, including oatmeal: International trade, average 1910–1914, annual 1924–1927*

Country	Year ended June 30									
	Average, 1910–1914		1924		1925		1926		1927, preliminary	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
PRINCIPAL EXPORTING COUNTRIES	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
Algeria	[1] 79	[1] 4,102	277	7,163	795	642	68	2,595	1,560	102
Argentina	[2] 55	[2] 42,569	-------	36,317	-------	48,533	-------	32,006	-------	[3,4] 40,103
Australia	[2] 898	[2] 270	139	288	8	324	-------	[3,4] 97	-------	[3,4] 262
British India	[1,5] 87	[1,5] 43	-------	62	-------	50	-------	53	-------	52
Bulgaria	-------	[1] 178	-------	[1] 4	(6)	10	-------	4	-------	-------
Canada	84	15,245	186	35,914	1,059	42,339	2,246	35,951	2,051	13,620
Chile	[2] 2	[2] 2,469	-------	1,914	-------	3,810	-------	4,093	-------	6,087
Hungary	[1] 1,420	[1] 12,416	2	3,476	280	518	7	3,806	(6)	2,381
Rumania	[1,5] 72	[1,5] 10,493	2	4,464	6	5,433	1	1,352	-------	[3] 6,634
Russia	[1] 1,206	[1] 70,466	-------	9,592	-------	113	-------	1,354	-------	-------
Tunis	[1] 2	[1] 2,875	(6)	[3] 2,606	[1] 116	[3] 742	28	1,462	[7] 45	[7] 994
United States	5,352	9,655	4,244	8,796	3,041	16,777	185	39,686	99	15,041
Yugoslavia	-------	-------	-------	[1] 190	-------	[3] 470	-------	[3] 1,056	-------	[3,8] 744
PRINCIPAL IMPORTING COUNTRIES										
Austria	[1] 2,295	[1] 114	6,048	[1] 32	6,683	[9,10] 4	4,877	11	[9,11] 4,776	[9,11] 7
Belgium	8,420	62	6,218	327	8,285	113	9,618	25	6,561	121
Ceylon	[2,9] 90	-------	[3,10] 52	-------	[3] 52	-------	[3] 61	-------	[3] 69	-------
Cuba	1,291	-------	1,675	-------	1,855	-------	1,502	-------	[12] 655	-------
Czechoslovakia	-------	-------	2,602	3,236	2,747	1,432	4,747	44	311	2,127
Denmark	[1] 4,687	[1] 152	2,848	558	2,621	488	842	411	1,985	164
Estonia	-------	-------	[3,10] 1,769	-------	242	-------	[3] 669	-------	378	-------
Finland	[2,9] 1,150	[2,9] 356	5,095	1	1,297	15	1,529	17	1,279	6
France	29,846	122	5,341	3,584	4,068	960	14,110	388	[9,11] 2,570	[9,11] 436
Germany	37,202	33,575	1,356	5,733	20,076	7,223	28,204	5,334	19,255	7,832
Greece	-------	-------	[1] 212	-------	[3] 694	-------	[3,13] 5	-------	-------	-------
Irish Free State	-------	-------	-------	-------	3,351	[4] 2,344	2,862	3,485	1,824	2,756
Italy	8,158	65	6,240	22	8,731	128	7,743	42	7,723	(6)
Japan	[1] 5	[1] 42	[1] 1,172	-------	[3] 258	-------	[3] 190	(6)	[3,10] 124	-------
Latvia	-------	-------	[1] 1,490	[1] 98	[3] 505	[1] 416	[3] 568	[7] 27	[3] 606	[9,11] 4
Netherlands	[1] 38,862	[1] 30,771	5,971	604	5,569	502	7,477	287	6,452	167
Norway	[1,14] 497	[1,14] 27	[4] 2,677	4	[4] 1,494	6	1,413	11	484	6
Poland	-------	-------	[1,4] 11	[1,4] 413	[1,4] 5,505	[1,4] 10	1,283	5,926	2,867	1,048
Sweden	[1] 6,468	[1] 1,899	6,878	521	3,229	715	2,908	329	1,631	2,426
Switzerland	[1] 12,464	[1] 13	10,036	7	9,099	4	10,662	4	9,895	4
Union of South Africa	[2] 366	[2] 434	[15] 324	[4] 169	[15] 252	[4] 515	[15] 231	[4] 125	[15] 191	[4] 69
United Kingdom	68,371	[2] 1,591	43,137	1,883	33,760	[4] 1,104	36,897	1,136	24,911	2,024
Total, 35 countries	229,429	240,004	116,092	127,978	125,678	135,740	140,933	141,117	98,302	105,217

Bureau of Agricultural Economics. Official sources except where otherwise noted.

[1] Year ended July 31, International Yearbook of Agricultural Statistics.
[2] Average of calendar years 1909–1913.
[3] International Crop Report and Agricultural Statistics.
[4] Oats only.
[5] Average for the seasons 1911–12 to 1913–14.
[6] Less than 500 bushels.
[7] 9 months, July–March.
[8] 10 months ended Apr. 30.
[9] International Yearbook of Agricultural Statistics.
[10] 11 months.
[11] 10 months ended May 31.
[12] 6 months.
[13] 2 months.
[14] Season 1913–14.
[15] Oatmeal only.

TABLE 76.—*Oats: Estimated price per bushel, received by producers, United States, 1909–1927*

Year beginning August—	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	July 15	Weighted av.
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
Average:													
1909–1913	40.9	38.8	38.4	38.2	38.3	39.0	39.8	40.3	40.9	41.5	41.8	40.9	39.9
1914–1920	58.8	55.9	54.6	54.8	56.4	58.7	60.3	62.1	64.3	65.2	64.0	61.9	58.5
1921–1925	38.6	37.4	38.4	38.9	40.6	42.2	43.0	43.0	42.5	42.9	43.1	41.8	40.4
1909	46.2	41.6	41.0	40.6	41.5	43.9	45.5	45.8	44.4	43.2	42.6	41.9	43.2
1910	40.0	37.3	35.6	34.6	33.8	33.2	33.0	32.6	32.8	34.0	36.1	38.8	36.2
1911	40.3	41.4	43.2	44.4	45.0	46.3	48.6	50.9	54.0	55.6	53.9	48.4	46.1
1912	39.6	34.3	33.6	32.8	32.0	32.3	32.8	33.1	33.6	35.1	36.8	37.6	34.9
1913	38.4	39.4	38.8	38.6	39.2	39.2	39.1	39.2	39.5	39.8	39.4	37.8	38.9
1914	39.5	42.8	43.1	43.4	44.4	47.6	51.1	52.8	53.4	52.4	49.0	46.0	44.9
1915	42.0	36.5	34.7	35.5	37.6	41.8	43.6	42.4	42.3	42.4	41.2	40.2	39.3
1916	41.6	43.8	46.8	50.7	51.9	53.3	56.0	59.2	66.2	70.4	69.4	71.3	51.4
1917	67.7	62.0	62.0	64.2	70.2	76.3	82.4	87.6	87.4	82.0	77.2	74.6	72.1
1918	71.6	70.6	69.6	69.6	70.8	67.6	63.4	64.2	68.4	71.0	71.0	73.1	70.1
1919	73.5	70.0	68.6	69.6	74.3	80.4	83.6	87.6	94.5	100.6	103.7	93.2	80.3
1920	76.0	65.4	57.6	50.2	45.8	43.7	41.8	40.6	38.0	37.4	36.8	34.7	51.1
1921	32.0	30.6	30.1	29.7	30.6	31.9	34.7	36.6	37.2	38.2	37.8	36.2	33.4
1922	33.6	33.4	36.4	38.8	40.3	41.5	42.4	43.5	44.8	45.3	43.7	40.2	39.0
1923	37.6	38.0	39.4	40.8	42.6	43.4	45.4	46.2	46.5	46.3	46.8	49.4	42.6
1924	49.1	47.1	48.9	47.4	50.6	54.0	53.4	49.7	44.7	45.4	48.3	45.3	48.3
1925	40.7	38.1	37.2	37.6	39.1	40.0	39.2	38.8	39.4	39.5	38.9	37.7	38.8
1926	37.9	35.6	39.0	39.8	41.1	42.6	43.4	43.4	43.2	45.4	48.0	46.3	41.1
1927	44.4	43.9	44.6	45.1	48.1								

Bureau of Agricultural Economics. Based on returns from special price reporters. Mean of prices reported on 1st of month and 1st of succeeding month, August, 1909–December, 1923.

TABLE 77.—*Oats, No. 3 white: Weighted average price*[1] *per bushel of reported cash sales, Chicago, 1909–1927*

Year beginning August—	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Weighted av.[1]
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
Average:													
1909–1913	38	39	38	38	39	41	40	40	41	41	42	42	40
1914–1920	57	56	55	57	60	62	62	64	67	66	65	65	60
1921–1925	39	40	41	42	44	45	44	43	43	43	44	43	42
1909	38	39	40	40	44	48	47	44	42	40	38	41	42
1910	35	34	32	32	32	33	31	31	32	34	39	44	33
1911	41	45	47	48	47	50	52	53	57	55	53	49	50
1912	33	33	33	32	33	33	33	32	35	38	40	40	35
1913	42	43	40	40	40	39	39	39	39	40	40	37	40
1914	42	48	46	48	49	53	58	57	57	54	49	53	50
1915	41	34	36	36	42	48	45	42	44	43	39	41	41
1916	44	46	49	55	53	57	56	61	69	70	67	78	54
1917	61	60	60	65	77	82	89	93	89	77	77	77	71
1918	70	72	69	72	72	65	58	63	70	69	70	78	70
1919	73	68	70	73	82	86	86	93	101	109	113	91	80
1920	70	62	54	51	48	44	42	42	36	39	37	34	51
1921	32	35	31	33	34	34	36	36	38	38	37	36	35
1922	32	38	42	43	44	43	44	45	46	45	48	40	41
1923	38	40	43	43	44	46	48	47	48	48	51	54	45
1924	50	48	50	50	58	58	53	48	42	45	49	44	50
1925	41	39	39	40	42	42	41	40	42	41	40	42	41
1926	38	38	44	42	46	46	43	44	45	50	49	45	43
1927	47	47	48	49	54								

Bureau of Agricultural Economics. Compiled from the Chicago Daily Trade Bulletin. Data for 1899–1908 available in 1924 Yearbook, p. 628, Table 94.

[1] Average of daily prices weighted by car-lot sales.

TABLE 78.—*Barley: Acreage, production, value, exports, etc., United States, 1849, 1859, 1866–1927*

Year	Acreage harvested	Average yield per acre	Production	Price per bushel received by producers Dec. 1	Farm value Dec. 1	Value per acre [1]	Price per bushel at Chicago, year beginning August [2]	Foreign trade, including barley flour and malt, year beginning July 1 [3]			
								Domestic exports [4]	Imports [5]	Net balance [6]	
										Total	Percentage of production
	1,000 acres	*Bush. of 48 lbs.*	*1,000 bushels*	*Cents*	*1,000 dollars*	*Dollars*	*Cents*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*Per cent*
1849			*5,167*						20	−20	
1859			*15,826*						5		
1866	493	22.9	11,284	70.2	7,916	16.06			3,247	−2,877	
1867	1,131	22.7	25,727	70.1	18,028	15.94		10	3,784	−3,774	
1868	937	24.4	22,896	109.0	24,948	26.63		59	5,070	−5,011	
1869			*29,761*								
1869	1,026	27.9	28,652	70.8	20,298	19.78	48	255	6,727	−6,472	
1870	1,109	23.7	26,295	79.1	20,792	18.75	66	340	4,867	−4,502	
1871	1,114	24.0	26,718	75.8	20,264	18.19	49	87	5,566	−5,467	
1872	1,397	19.2	26,846	68.6	18,416	13.18	55	482	4,498	−3,997	
1873	1,387	23.1	32,044	86.7	27,794	20.04	111	320	5,114	−4,794	
1874	1,581	20.6	32,552	86.0	27,998	17.71	102	91	6,386	−6,293	
1875	1,790	20.6	36,909	74.1	27,368	15.29	51	318	10,547	−10,208	
1876	1,767	21.9	38,710	63.0	24,403	13.81	39	1,186	6,989	−5,752	
1877	1,669	21.4	35,638	62.5	22,287	13.35	37	3,922	7,267	−2,574	
1878	1,790	23.6	42,246	57.9	24,454	13.66	40	716	6,210	−5,398	
1879	*1,998*	*22.0*	*43,997*								
1879	1,998	24.4	48,721	59.4	28,939	14.48	50	1,134	8,066	−6,915	
1880	1,843	24.5	45,165	66.6	30,091	16.33	74	893	10,152	−9,259	
1881	1,968	20.9	41,161	82.3	33,863	17.21	86	218	13,217	−12,999	
1882	2,272	21.5	48,954	62.9	30,768	13.54	54	454	11,284	−10,818	
1883	2,379	21.1	50,136	58.7	29,420	12.37	[7] 47	760	8,738	−7,977	
1884	2,609	23.5	61,203	48.7	29,779	11.41	[7] 42	667	10,331	−9,658	
1885	2,729	21.4	58,360	56.3	32,868	12.04	42	301	10,491	−10,175	
1886	2,653	22.4	59,428	53.6	31,841	12.00	[7] 45	1,349	10,546	−9,156	
1887	2,902	19.6	56,812	51.9	29,464	10.15	63	632	11,029	−10,392	
1888	2,996	21.3	63,884	59.0	37,672	12.57	53	1,511	11,505	−9,994	
1889	*3,221*	*24.3*	*78,333*								
1889	3,221	24.3	78,213	41.6	32,574	10.11	42	1,486	11,530	−10,035	
1890	3,406	21.4	73,017	62.6	45,719	13.42	66	1,055	5,101	−3,825	
1891	3,705	26.1	96,589	51.8	50,051	13.51	50	2,893	3,151	+247	.3
1892	3,892	23.6	92,037	46.5	42,790	10.99	50	3,139	1,973	+1,200	1.3
1893	3,855	21.7	83,700	40.5	33,922	8.80	48	5,301	796	+4,536	5.4
1894	4,005	19.5	78,051	43.5	33,924	8.47	51	1,711	2,127	[8] +405	.5
1895	4,263	26.9	114,732	32.0	36,678	8.60	31	7,862	842	+7,036	6.1
1896	4,172	23.8	99,394	30.0	29,814	7.15	30	20,294	1,282	+19,021	19.1
1897	4,150	24.9	103,279	35.2	36,346	8.76	[9] 40	11,607	129	+11,478	11.1
1898	4,237	23.5	99,922	38.9	39,003	9.21	45	2,679	115	+2,566	2.6
1899	*4,470*	*26.8*	*119,635*								
1899	4,470	26.1	116,552	39.0	45,479	10.17	43	23,931	194	+23,759	20.4
1900	4,546	21.1	96,041	40.5	38,896	8.56	[9] 56	6,619	175	+6,445	6.7
1901	4,742	25.7	121,784	45.2	55,008	11.61	64	9,079	60	+9,019	7.4
1902	5,126	29.1	149,389	45.5	67,944	13.25	56	8,745	59	+8,680	5.8
1903	5,568	26.4	146,864	45.4	66,700	11.98	56	11,280	94	+11,187	7.6
1904	5,912	27.4	162,105	41.6	67,427	11.41	49	11,105	84	+11,021	6.8
1905	6,250	27.2	170,089	39.4	66,950	10.71	50	18,431	20	+18,410	10.8
1906	6,730	28.6	192,270	41.6	80,069	11.90	61	8,616	41	+8,632	4.5
1907	6,941	24.5	170,008	66.3	112,675	16.23	84	4,554	202	+4,370	2.6
1908	7,294	25.3	184,857	55.2	102,037	13.99	67	6,729	4	+6,725	3.6
1909	*7,699*	*22.5*	*173,344*								
1909	7,699	24.4	187,973	54.8	102,947	13.37	67	4,454	5	+4,449	2.4
1910	7,743	22.5	173,832	57.8	100,426	12.97	92	9,507	187	+9,320	5.4
1911	7,627	21.0	160,240	86.9	139,182	18.25	122	1,055	2,772	[8] +1,117	.7

[1] Based on farm price Dec. 1.

[2] Prices 1869–1889 compiled from annual reports of Chicago Board of Trade averages of weekly quotations, No. 3. Subsequently from Bureau of Labor Statistics as follows: Bulletin No. 39, 1890–1901—averages of weekly quotations, August, 1890–October, 1897, for No. 3; November, 1897–December, 1901. Choice to fancy malting, by sample. Wholesale Price Bulletins—monthly quotations, January, 1902–December, 1913, choice to fancy malting; January, 1914—September, 1927, fair to good malting. Beginning October, 1927, reported as feeding, but as grade remained unchanged no change was made in comparative prices.

[3] 1849, 1859, 1866–1917 compiled from Commerce and Navigation of the United States; 1918, Foreign Commerce and Navigation of the United States; 1919–1926, Monthly Summary of Foreign Commerce of the United States, June issues, and January and June issues, 1927. Malt converted to terms of barley on the basis that 1.1 bushels of malt is the product of 1 bushel of barley. Barley flour converted on the basis that 1 barrel of flour is the product of 5 bushels of barley.

[4] Barley not reported prior to 1864. Malt not reported prior to 1869, reported in value only 1869–1879. Flour not reported prior to 1919.

[5] Barley—General imports 1849–1909, imports for consumption 1910–1927. Malt not reported prior to 1870; reported in value only 1870–1872. General imports 1870–1914, imports for consumption 1915–1927. Flour, not reported prior to 1915; imports for consumption 1915–1927.

[6] The difference between total exports (i. e., domestic exports plus reexports) and total imports.

[7] Less than 30 weeks reported. [8] Net imports. [9] Average for 11 months.

TABLE 78.—*Barley: Acreage, production, value, exports, etc., United States, 1849, 1859, 1866–1927*—Continued

Year	Acreage harvested	Average yield per acre	Production	Price per bushel received by producers Dec. 1	Farm value Dec. 1	Value per acre	Price per bushel at Chicago, year beginning August	Foreign trade, including barley flour and malt, year beginning July 1: Domestic exports	Imports	Net balance: Total	Percentage of production
	1,000 acres	*Bush. of 48 lbs.*	*1,000 bushels*	*Cents*	*1,000 dollars*	*Dollars*	*Cents*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*Per cent*
1912	7,530	29.7	223,824	50.5	112,957	15.00	68	17,874	15	+17,859	8.0
1913	7,499	23.8	178,189	53.7	95,731	12.77	65	6,945	351	+6,594	3.7
1914	7,565	25.8	194,953	54.3	105,903	14.00	72	28,712	103	+28,609	14.7
1915	7,148	32.0	228,851	51.6	118,172	16.53	69	30,821	37	+30,783	13.5
1916	7,757	23.5	182,309	88.1	160,646	20.71	119	20,319	461	+19,858	10.9
1917	8,933	23.7	211,759	113.7	240,758	26.95	146	28,717	517	+28,200	13.3
1918	9,740	26.3	256,225	91.7	234,942	24.12	104	26,988	24	+26,964	10.5
1919	*6,473*	*18.9*	*122,025*								
1919	6,720	22.0	147,608	120.6	178,080	26.50	145	34,555	335	+34,219	23.2
1920	7,600	24.9	189,332	71.3	135,083	17.77	78	27,255	20	+27,234	14.4
1921	7,414	20.9	154,946	41.9	64,934	8.76	61	27,543	8	+27,536	17.8
1922	7,317	24.9	182,068	52.5	95,560	13.06	65	21,909	29	+21,880	12.0
1923	7,835	25.2	197,691	54.1	107,038	13.66	72	13,913	41	+13,873	7.0
1924	*6,767*	*23.5*	*159,139*								
1924	6,925	26.2	181,575	74.1	134,590	19.44	90	28,543	39	+28,504	15.7
1925	7,097	26.7	213,863	58.8	125,709	15.72	72	30,448	41	+30,407	10.2
1926	7,970	23.2	184,905	57.5	106,237	13.33	77	19,670	33	+19,637	14.6
1927 [10]	9,492	28.0	265,577	67.8	180,127	18.98					

Bureau of Agricultural Economics. Production figures are estimates of the crop-reporting board; italic figures are census returns.

[10] Preliminary.

TABLE 79.—*Barley: Acreage and production, by States, average 1921–1925, annual 1925–1927*

State	Acreage: Average, 1921–1925	1925	1926	1927 [1]	Production: Average, 1921–1925	1925	1926	1927 [1]
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
Maine	3	3	4	4	98	105	120	108
Vermont	8	6	6	6	219	192	180	174
New York	160	157	179	188	4,240	4,553	5,066	5,452
New Jersey	[2] 1	1	1	2	[2] 28	27	33	74
Pennsylvania	13	15	18	21	306	383	486	588
Ohio	82	110	116	155	2,179	3,410	3,712	4,185
Indiana	35	32	23	28	730	736	575	666
Illinois	213	250	302	453	6,443	8,250	9,362	13,364
Michigan	147	129	133	186	3,446	3,160	3,790	5,301
Wisconsin	447	461	521	620	13,518	16,965	17,974	21,390
Minnesota	964	1,098	1,307	1,503	25,806	32,940	32,675	45,090
Iowa	153	175	268	456	4,400	5,478	8,174	14,318
Missouri	6	6	9	7	143	186	216	161
North Dakota	1,311	1,732	1,472	1,663	28,341	38,970	21,050	42,406
South Dakota	919	915	778	1,089	20,890	23,790	7,858	32,670
Nebraska	253	233	227	246	6,140	5,662	4,609	7,577
Kansas	711	380	266	452	13,422	6,080	3,032	5,695
Maryland	7	12	10	9	232	396	343	274
Virginia	12	16	14	13	309	416	434	338
North Carolina	[2] 8	10	15	20	[2] 196	230	390	480
Kentucky	6	6	7	6	155	156	231	162
Tennessee	16	22	40	42	360	506	1,200	798
Oklahoma	143	126	110	79	2,857	1,764	2,970	1,304
Texas	112	116	174	195	2,243	835	6,090	3,120
Montana	101	130	150	195	2,369	2,730	3,600	6,435
Idaho	101	124	112	129	3,757	5,456	4,144	5,676
Wyoming	23	34	42	59	702	1,122	1,386	2,124
Colorado	285	410	380	456	6,366	8,610	6,080	10,032
New Mexico	8	5	8	8	152	85	208	144
Arizona	26	20	25	20	863	700	875	700
Utah	18	18	20	30	642	774	800	1,410
Nevada	6	8	7	9	222	384	280	405
Washington	80	91	64	58	2,656	3,094	2,176	2,436
Oregon	80	96	82	91	2,416	3,168	2,293	3,185
California	1,045	1,050	1,080	994	29,301	32,550	32,400	27,335
United States	7,498	7,997	7,970	9,492	180,029	213,863	184,905	265,577

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

[1] Preliminary. [2] 2-year average.

TABLE 80.—*Barley: Yield per acre and estimated price per bushel, December 1, by States, average 1914–1920, 1921–1925, annual 1923–1927*

State	Yield per acre							Estimated price per bushel						
	Av., 1914–1920	Av., 1921–1925	1923	1924	1925	1926	1927	Av., 1914–1920	Av., 1921–1925	1923	1924	1925	1926	1927
	Bush.	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
Maine	26.1	29.0	30.0	26.0	35.0	30.0	27.0	121	95	100	108	80	92	94
Vermont	30.0	29.2	29.0	31.0	32.0	30.0	29.0	116	92	95	103	83	85	95
New York	27.7	26.7	26.8	30.6	29.0	28.3	29.0	105	76	75	91	77	75	80
New Jersey	------	[1] 28.0	------	29.0	27.0	33.0	37.0	-----	[1] 90	-----	92	88	85	83
Pennsylvania	26.7	24.3	22.4	26.5	25.5	27.0	28.0	100	75	72	90	86	80	83
Ohio	28.4	26.3	27.0	28.0	31.0	32.0	27.0	87	67	63	85	70	62	72
Indiana	28.5	21.2	23.0	24.0	23.0	25.0	23.8	89	64	65	77	71	66	73
Illinois	32.3	30.0	29.0	32.0	33.0	31.0	29.5	91	60	58	75	63	58	73
Michigan	25.3	24.2	24.0	29.3	24.5	28.5	28.5	92	68	64	80	72	65	76
Wisconsin	31.2	30.4	28.5	32.0	36.8	34.5	34.5	92	63	61	78	66	65	75
Minnesota	25.1	26.7	25.0	32.0	30.0	25.0	30.0	80	49	44	69	52	51	65
Iowa	29.4	28.6	28.5	31.0	31.3	30.5	31.4	82	54	52	70	57	56	66
Missouri	25.3	25.6	27.0	25.0	31.0	24.0	23.0	94	78	78	82	95	80	95
North Dakota	18.6	21.4	17.5	26.0	22.5	14.3	25.5	72	42	38	62	43	46	59
South Dakota	25.9	23.1	22.5	27.0	26.0	10.1	30.0	76	44	40	64	47	52	58
Nebraska	25.7	24.0	28.0	25.0	24.3	20.7	30.8	71	47	41	63	54	58	55
Kansas	20.3	18.4	22.2	16.5	16.0	11.4	12.6	74	49	49	65	58	61	55
Maryland	30.8	32.6	33.0	35.0	33.0	34.3	30.5	99	80	80	93	87	80	87
Virginia	27.4	26.1	27.0	27.0	26.0	31.0	26.0	110	87	80	105	97	90	87
North Carolina	------	[1] 23.0	------	23.0	23.0	26.0	24.0	-----	[1] 115	----	110	120	100	110
Kentucky	27.6	25.8	27.0	24.0	26.0	33.0	27.0	110	85	84	101	95	86	91
Tennessee	22.2	21.9	23.0	20.0	23.0	30.0	19.0	120	100	100	110	110	96	100
Oklahoma	21.9	19.6	22.0	23.0	14.0	27.0	16.5	96	63	70	70	75	58	65
Texas	23.6	19.8	24.0	25.0	7.2	35.0	16.0	96	69	68	76	90	53	70
Montana	21.9	23.4	25.5	25.0	21.0	24.0	33.0	84	60	48	69	72	64	60
Idaho	33.6	36.8	43.0	31.0	44.0	37.0	44.0	91	62	58	82	56	60	68
Wyoming	32.3	29.8	30.0	29.0	33.0	33.0	36.0	107	65	65	72	61	62	61
Colorado	28.7	22.2	29.0	20.0	21.0	16.0	22.0	85	56	54	72	58	55	56
New Mexico	28.3	18.0	19.0	15.0	17.0	26.0	18.0	97	76	80	60	85	65	70
Arizona	35.1	33.0	35.0	30.0	35.0	35.0	35.0	112	90	95	88	100	85	75
Utah	35.7	35.8	40.6	28.5	43.0	40.0	47.0	97	69	70	87	85	72	76
Nevada	37.4	34.7	25.4	39.5	48.0	40.0	45.0	117	91	83	110	82	85	80
Washington	33.0	32.6	45.7	22.6	34.0	34.0	42.0	94	68	60	85	68	65	77
Oregon	30.5	29.8	35.0	22.0	33.0	28.0	35.0	101	73	67	100	73	65	77
California	27.4	27.7	30.2	21.9	31.0	30.0	27.5	99	76	70	116	75	58	93
United States	25.5	24.8	25.2	26.2	26.7	23.2	28.0	84.5	56.3	54.1	74.1	58.8	57.5	67.8

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

[1] 2-year average.

TABLE 81.—*Barley: Acreage, yield per acre, and production in specified countries, average 1909–1913, annual 1924–1927*

Country	Acreage: Average, 1909–1913[1]	Acreage: 1924	Acreage: 1925	Acreage: 1926	Acreage: 1927	Yield per acre: Average, 1909–1913[1]	Yield per acre: 1924	Yield per acre: 1925	Yield per acre: 1926	Yield per acre: 1927	Production: Average, 1909–1913[1]	Production: 1924	Production: 1925	Production: 1926	Production: 1927
NORTHERN HEMISPHERE															
NORTH AMERICA	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
Canada	1,574	3,407	4,076	3,637	3,506	28.8	26.1	27.6	27.4	28.0	45,275	88,807	112,668	99,684	98,242
United States	7,620	6,925	8,088	8,200	9,492	24.3	26.2	26.4	23.0	28.0	184,812	181,575	213,863	188,340	265,577
Mexico	[2] 1,436	711	432	427	----	[2] 4.9	5.6	8.8	9.4	----	7,021	3,990	3,802	4,004	----
Total North American countries reporting area and production all years shown	9,194	10,332	12,164	11,837	12,998	25.0	26.2	26.8	24.3	28.0	230,087	270,382	326,531	288,024	363,819
EUROPE															
United Kingdom:															
England and Wales	1,488	1,314	1,318	1,148	1,049	34.0	35.4	35.8	37.2	38.4	50,658	46,572	47,133	42,761	40,241
Scotland	191	152	153	122	120	37.6	37.4	41.5	41.7	----	7,173	5,691	6,347	5,087	----
Ireland	166	166	148	143	122	45.2	35.3	42.4	47.3	----	7,510	5,853	6,276	6,764	----
Norway	89	136	139	143	143	32.2	34.5	37.3	35.8	33.2	2,867	4,692	5,180	5,125	4,747
Sweden	448	423	412	443	415	33.6	31.0	35.0	33.6	29.7	15,035	13,252	14,426	14,869	12,346
Denmark	639	745	744	770	819	42.0	45.9	49.2	43.4	43.7	26,860	34,219	36,574	33,415	35,825
Netherlands	68	63	73	67	66	48.1	56.5	48.7	53.1	45.9	3,270	3,557	3,556	3,558	3,027
Belgium	88	78	79	87	78	50.5	47.9	52.7	48.3	46.6	4,446	3,735	4,165	4,202	3,637
Luxemburg	3	9	9	7	6	27.3	19.3	19.4	26.3	24.8	82	174	175	184	149
France	1,987	1,765	1,727	1,706	1,754	26.6	27.2	27.3	26.9	31.7	52,826	48,051	47,159	45,855	55,570
Spain	3,510	4,344	4,414	4,473	4,405	21.3	19.3	22.4	21.5	20.3	74,689	83,700	98,925	96,284	89,485
Portugal	(170)	156	----	185	----	----	11.4	----	8.0	----	(1,200)	1,771	1,988	1,487	1,963
Italy	647	572	576	587	578	16.4	15.2	22.3	18.8	16.4	10,638	8,685	12,860	11,023	9,461
Switzerland	13	16	15	16	16	33.9	32.4	35.5	35.3	36.4	441	519	533	565	583
Germany	3,464	3,573	3,545	3,671	3,654	38.6	30.8	33.7	30.8	34.4	133,787	110,226	119,373	113,102	125,708
Austria	421	341	348	362	362	23.9	21.1	26.5	25.1	28.5	10,065	7,208	9,217	9,074	10,315
Czechoslovakia	2,275	1,676	1,714	1,751	1,760	31.3	26.6	33.4	30.0	31.3	71,108	44,583	57,206	52,500	55,020
Hungary	1,322	1,008	1,019	1,049	1,011	24.5	14.6	25.0	24.3	23.1	32,369	14,712	25,430	25,509	23,319
Yugoslavia	1,058	899	883	867	984	19.1	15.0	20.5	19.9	14.7	20,229	13,478	18,144	17,274	14,448
Greece	[3] 369	(300)	574	552	559	[3] 18.8	----	16.6	14.7	16.8	[3] 6,953	4,284	9,515	8,135	9,396
Bulgaria	516	529	549	547	555	20.1	13.4	26.7	21.9	25.7	10,380	7,067	14,651	11,970	14,238
Rumania	[4] 3,378	4,573	4,211	3,834	4,359	[4] 18.3	6.7	11.1	20.2	13.2	[4] 61,677	30,759	46,817	77,291	57,411
Poland	3,048	3,011	3,025	3,048	3,058	22.7	18.4	25.5	23.4	24.5	69,055	55,488	77,036	71,401	74,871

Lithuania	536	484	507	532	487	16.5	19.2	22.2	21.5	17.9	8,820	9,317	11,252	11,430	8,721
Latvia	463	443	436	470	458	17.1	16.8	18.7	18.4	14.3	7,922	7,437	8,169	8,661	6,553
Estonia	329	307	284	300	295	18.8	18.0	18.6	20.1	14.7	6,201	5,539	5,289	6,038	4,345
Finland	278	272	272	272	274	17.8	21.9	23.8	26.4	20.4	4,947	5,969	6,467	7,170	5,576
Russia, European	23,281	15,010	13,687	15,618	15,300	16.4	9.8	17.5	14.8	-------	381,235	147,582	239,036	230,504	-------
Malta [5]	5	6	6	6	7	22.8	44.8	44.8	44.8	-------	114	269	269	269	-------
Total European countries reporting area and production all years shown	26,437	26,886	26,873	26,702	27,145	25.9	20.9	25.3	25.4	24.5	[6] 685,325	563,223	679,252	677,496	664,992
Estimated European total, excluding Russia	27,000	27,500	27,400	27,200	27,200	-------	-------	-------	-------	-------	701,000	577,000	694,000	691,000	678,000
AFRICA															
Morocco	(3,000)	3,120	3,369	3,157	2,570	-------	17.1	14.3	7.4	14.3	(38,000)	53,278	48,227	23,391	36,744
Algeria	3,395	3,158	3,377	3,543	3,408	13.5	6.0	10.6	6.5	11.6	45,974	18,981	35,840	23,000	39,500
Tunis	1,228	692	1,245	1,406	766	6.4	3.7	5.5	6.3	6.0	7,826	2,526	6,889	8,819	4,593
Egypt	398	372	366	333	376	29.8	28.9	30.4	30.3	31.8	11,867	10,754	11,144	10,097	11,961
Total Africa	8,021	7,342	8,357	8,439	7,120	12.9	11.7	12.2	7.7	13.0	103,667	85,539	102,100	65,307	92,798
ASIA															
Turkey	-------	2,346	2,602	2,179	-------	-------	-------	22.2					57,758	-------	-------
Cyprus	(115)	112	110	122	-------	-------	15.8	18.9	15.9	-------	2,183	1,766	2,077	1,939	-------
India	8,877	7,126	6,898	6,573	-------	16.4	19.2	17.9	18.3	-------	145,496	137,060	123,387	120,587	-------
Russia, Asiatic	2,912	1,960	2,224	2,454	-------	12.6	13.9	13.8	12.1	-------	36,795	27,196	30,756	29,659	-------
Syria and Lebanon	-------	925	631	601	655	-------	6.3	10.2	17.6	23.4	(5,000)	5,814	6,442	10,588	15,325
Japan	3,042	2,459	2,467	2,431	2,353	31.5	30.5	37.1	36.2	30.4	95,784	75,024	91,468	88,075	71,555
Chosen	1,623	2,124	2,164	2,185	-------	19.9	17.5	18.7	17.5	-------	32,243	37,074	40,363	38,307	34,898
Total Northern Hemisphere countries reporting area and production all years shown	46,694	47,019	49,861	49,409	49,616	23.9	21.1	24.1	22.6	24.0	1,114,863	994,168	1,199,351	1,118,902	1,193,164
Estimated Northern Hemisphere total excluding Russia and China	64,200	63,500	65,800	64,500	-------	-------	-------	-------	-------	-------	1,408,000	1,288,000	1,487,000	1,405,000	-------
SOUTHERN HEMISPHERE															
Brazil	-------	13	12	23	-------	-------	21.8	27.4	16.4	-------	283	283	329	377	-------
Chile	111	162	195	138	-------	36.8	30.6	35.2	37.7	-------	4,090	4,964	6,362	5,202	-------
Uruguay	[4] 7	7	7	8	5	[4] 11.1	14.7	15.3	8.8	-------	[4] 78	103	107	70	-------
Argentina	230	824	900	979	1,186	19.1	8.5	18.9	18.8	14.3	[4] 4,395	6,974	17,054	18,372	16,994
Union of South Africa [7]	[3] 109	83	-------	-------	-------	[3] 11.7	12.3	-------	-------	-------	[3] 1,274	1,025	1,238	1,686	1,424

[1] Where changes in boundary have occurred, averages are estimated for territory within present boundaries.
[2] 3-year average.
[3] 1 year only.
[4] 4-year average.
[5] Includes maslin.
[6] The estimate for the 5-year period 1909–1913 given in this table is somewhat larger than the figure obtained by averaging those 5 years in Table 82. This is because in this table estimates for warring countries are for postwar boundaries, whereas in Table 82 they are for pre-war territory. As a result in excluding Russia, which lost territory during the war, a smaller area is excluded in this table than in Table 82.
[7] Excludes native locations which produced 38,550 bushels in 1917–18 and 29,056 bushels in 1920–21.

TABLE 81.—*Barley: Acreage, yield per acre, and production in specified countries, average 1909–1913, annual 1924–1927*—Continued

Country	Acreage					Yield per acre					Production				
	Average, 1909–1913	1924	1925	1926	1927	Average, 1909–1913	1924	1925	1926	1927	Average, 1909–1913	1924	1925	1926	1927
SOUTHERN HEMISPHERE—Continued	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
Australia	154	260	375			19.6	20.3	17.7			3,021	5,277	6,619		
New Zealand	35	25	26	29		36.1	33.2	37.9			1,264	831	986		
Total Southern Hemisphere reporting area and production all years shown	230	824	900	979	1,186	19.1	8.5	18.9	18.8	14.3	4,395	6,974	17,054	18,372	16,994
Estimated Southern Hemisphere total	800	1,500	1,800	1,700							17,000	22,000	35,000	35,000	
Total Northern and Southern Hemisphere countries reporting area and production all years shown	46,924	47,843	50,761	50,388	50,802	23.9	20.9	24.0	22.6	23.8	1,119,258	1,001,142	1,216,405	1,137,274	1,210,158
Estimated world total excluding Russia and China	65,000	65,000	67,600	66,200							[6] 1,425,000	1,310,000	1,522,000	1,440,000	

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture. Estimates given are for crops harvested during the calendar year in the Northern Hemisphere and the succeeding harvest in the Southern Hemisphere.

[6] The estimate for the 5-year period 1909–1913 given in this table is somewhat larger than the figure obtained by averaging those 5 years in Table 82. This is because in this table estimates for warring countries are for postwar boundaries, whereas in Table 82 they are for prewar territory. As a result in excluding Russia, which lost territory during the war, a smaller area is excluded in this table than in Table 82.

TABLE 82.—*Barley: World production, 1894–1927*

Year	Preliminary estimate of world production excluding Russia	Preliminary estimate of European totals excluding Russia	Selected countries							
			United States	Russia [1]	Germany	Japan	Canada	India	Spain	Rumania
	1,000,000 bushels	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*	*1,000,000 bushels*
1894	935	544	78	277	131	81	----------	----------	57	17
1895	1,008	527	115	226	128	80	----------	----------	47	22
1896	973	528	99	254	125	71	----------	----------	36	32
1897	907	481	103	239	118	73	----------	----------	46	21
1898	1,040	564	100	307	130	83	----------	----------	73	30
1899	1,017	533	117	227	137	77	----------	----------	54	5
1900	1,269	522	96	237	138	82	----------	----------	57	15
1901	1,085	570	122	240	153	83	----------	----------	80	24
1902	1,127	592	149	338	142	74	----------	----------	81	25
1903	1,099	589	147	357	153	60	----------	----------	64	30
1904	1,068	512	162	346	135	81	----------	----------	54	12
1905	1,067	532	170	347	134	77	----------	----------	46	26
1906	1,226	610	192	331	143	84	----------	----------	90	34
1907	1,161	569	170	377	161	90	----------	----------	54	20
1908	1,132	536	185	402	141	87	47	----------	70	13
1909	1,338	621	188	502	161	87	55	----------	79	20
1910	1,242	560	174	488	133	82	29	----------	76	29
1911	1,326	606	160	437	145	86	44	----------	87	26
1912	1,345	589	224	496	160	91	49	----------	60	21
1913	1,400	637	178	600	169	101	48	----------	69	27
1914	1,213	546	195	[2] 433	144	86	30	125	72	26
1915	1,244	477	229	[3] 429	114	95	54	143	84	29
1916	1,201	507	182	[4] 305	128	89	43	148	87	30
1917	1,170	427	212	[4] 325	[5] 90	89	55	156	78	----------
1918	1,273	420	256	----------	94	88	77	156	90	5
1919	1,117	479	148	----------	88	89	56	130	82	32
1920	1,249	552	189	[4] 216	82	85	63	150	90	68
1921	1,246	567	155	[4] 119	89	82	60	117	89	44
1922	1,313	601	182	[4] 137	74	81	72	146	78	94
1923	1,431	667	198	[4] 159	108	69	77	145	112	61
1924	1,310	577	182	[5] 175	110	[6] 75	89	137	84	31
1925	1,522	694	214	[5] 270	119	[6] 91	113	123	99	47
1926	1,440	691	188	[5] 260	113	[6] 88	100	121	96	77
1927 [7]	----------	678	266	[5] 216	126	[6] 72	98	----------	89	57

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture. For each year is shown the production during the calendar year in the Northern Hemisphere and the succeeding harvest in the Southern Hemisphere.

[1] Includes all Russian territory, 1894–1913.
[2] Total Russian Empire exclusive of the 10 Vistula Provinces of Russian Poland and the Province of Batum in Transcaucasia.
[3] Exclusive of Russian Poland, Lithuania, parts of present Latvia and Ukraine, and 2 Provinces of Transcaucasia.
[4] Estimated production within present boundaries of the Union of Socialist Soviet Republics excluding Turkestan, Transcaucasia, and the Far East, which regions in 1924 produced 20,897,000 bushels.
[5] Postwar boundaries beginning with 1917 and therefore not comparable with earlier years.
[6] Weighed bushels, those reported for the earlier years being measured bushels.
[7] Preliminary.

TABLE 83.—*Barley: Monthly marketings by farmers, as reported by about 3,500 mills and elevators, United States, 1917–1926*

Year beginning July	Percentage of year's receipts												
	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Season
1917	2.2	15.0	23.4	16.5	8.5	8.6	6.5	7.5	6.1	2.9	1.8	1.0	100.0
1918	2.4	9.7	8.4	4.4	7.8	3.3	1.3	.7	2.9	27.5	30.7	.9	100.0
1919	18.5	19.2	14.3	9.9	6.4	7.5	5.4	3.1	3.7	3.4	3.0	5.6	100.0
1920	7.0	16.5	15.0	9.9	9.9	7.2	6.7	5.5	6.5	4.2	5.7	5.9	100.0
1921	35.0	14.0	10.5	7.8	4.4	4.2	3.9	4.3	4.2	3.0	4.4	4.3	100.0
1922	17.4	22.9	14.6	10.8	5.2	6.0	4.8	3.2	3.5	1.9	2.7	7.0	100.0
1923	10.3	23.7	15.1	9.9	7.8	6.5	4.1	3.5	3.1	2.6	2.3	11.1	100.0
1924	10.0	25.7	20.3	14.0	6.2	4.7	4.3	5.2	2.6	2.5	1.6	2.9	100.0
1925	16.4	19.1	18.4	11.7	6.6	5.1	4.0	3.4	3.1	2.0	3.3	6.9	100.0
1926	17.4	16.5	11.6	7.4	6.2	4.8	5.1	3.2	3.9	3.6	4.1	16.2	100.0

Bureau of Agricultural Economics.

TABLE 84.—*Barley: Farm stocks, growing conditions, quality, and shipments, United States, 1910–1927*

Year beginning August	Stocks of old barley on farms Aug. 1 [1]	Condition of new crop				Weight per measured bushel of new barley [2]	Quality of new barley [3]	Stocks of barley on farms on Mar. 1 following [1]	Shipped out of county where grown [1]
		June 1	July 1	Aug 1	Sept. 1				
	1,000 bushels	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Pounds*	*Per cent*	*1,000 bushels*	*1,000 bushels*
1910	8,075	89.6	73.7	70.0	69.8	46.9	88.1	33,498	86,955
1911	5,763	90.2	72.1	66.2	65.5	46.0	84.9	24,754	91,620
1912	2,591	91.1	88.3	89.1	88.9	46.8	86.2	62,301	120,143
1913	11,252	87.1	76.6	74.9	73.4	46.5	86.4	44,126	86,262
1914	7,609	95.5	92.6	85.3	82.4	46.2	87.5	42,889	87,834
1915	6,330	94.6	94.1	93.8	94.2	47.4	90.5	58,301	98,965
1916	10,982	86.3	87.9	80.0	74.6	45.2	84.4	33,244	79,257
1917	3,775	89.3	85.4	77.9	76.3	46.6	90.9	44,419	84,056
1918	4,510	90.5	84.7	82.0	81.5	46.9	89.8	81,746	99,987
1919	11,897	91.7	87.4	73.6	69.2	45.2	84.8	33,820	50,471
1920	4,122	87.6	87.6	84.9	82.5	46.0	88.2	65,229	68,663
1921	13,487	87.1	81.4	71.4	68.4	44.4	82.5	42,294	55,738
1922	7,497	90.1	82.6	82.0	81.2	46.2	88.5	42,469	66,560
1923	6,805	89.0	86.1	82.6	79.5	45.3	86.6	44,930	68,190
1924	6,359	79.5	80.2	80.7	82.5	47.0	88.7	40,576	68,071
1925	5,728	83.1	81.2	79.5	80.3	45.9	88.1	52,915	80,547
1926	9,622	81.0	73.3	60.8	68.7	45.9	84.3	39,183	55,983
1927 [4]	3,754	81.5	84.2	83.3	82.9	46.8	90.3	----------	----------

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

[1] Based on percentage of entire crop as reported by crop reporters.
[2] Average weight per measured bushel as reported by crop reporters.
[3] Per cent of "a high medium grade" as reported by crop reporters.
[4] Preliminary.

TABLE 85.—*Barley: Receipts at markets named, averages by groups, 1909–1925, annual 1921–1926*

Year beginning August	Minneapolis	Duluth	Chicago	Milwaukee	Omaha	Total five markets	Fort William and Port Arthur [1]
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
Average:							
1909–1913	25,204	10,267	24,872	15,636	----------	----------	5,759
1914–1920	30,067	8,230	22,476	15,674	----------	----------	8,094
1921–1925	17,594	8,084	9,661	10,226	885	46,451	21,594
1921	11,926	5,179	7,573	9,330	1,152	35,160	11,597
1922	14,244	3,844	10,103	8,922	801	37,914	15,756
1923	15,396	3,654	9,755	9,077	948	38,830	15,910
1924	23,158	14,501	11,336	13,127	796	62,918	28,045
1925	23,245	13,244	9,540	10,673	729	57,431	36,662
1926 [2]	12,087	6,815	8,386	8,439	592	36,319	35,784

Bureau of Agricultural Economics. Compiled from reports of Minneapolis Chamber of Commerce, Duluth Board of Trade, Chicago Board of Trade, Milwaukee Chamber of Commerce, Omaha Grain Exchange, American Elevator and Grain Trade, and Canadian Grain Statistics.

[1] Crop year begins September.
[2] Beginning January, 1927, figures are subject to revision.

TABLE 86.—*Barley: International trade, average 1910–1914, annual 1924–1927*

Country	Year ended June 30									
	Average, 1910-1914		1924		1925		1926		1927, preliminary	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
PRINCIPAL EXPORTING COUNTRIES	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
Algeria	[1] 213	[1] 5, 482	202	9, 452	1, 964	957	282	4, 504	2, 736	388
Argentina	[2] 3	[2] 764	[3] 1	9, 313	[3] 5	4, 229	(4)	[3] 6, 383	-------	[5] 14, 110
Australia	[2] 159	[2] 51	(4)	1, 905	70	1, 553	-------	[5] 760	-------	[5] 2, 133
British India	[1, 6] 23	[1] 10, 640	(4)	[7] 11, 367	[1] 4	[7] 18, 075	[8] 5	[7] 684	-------	[7] 304
Bulgaria	-------	[1] 1, 876	(4)	[1] 484	(4)	523	-------	1, 117	-------	1, 025
Canada	66	5, 210	2	16, 577	(4)	27, 796	10	30, 893	29	42, 533
Chile	[2] 88	[2] 1, 062	-------	3, 737	-------	2, 362	-------	2, 480	-------	5, 596
Czechoslovakia	-------	-------	[1] 106	[5] 8, 182	2, 292	3, 153	1, 709	5, 134	9	5, 070
Hungary	[1] 229	[1] 11, 836	9	327	199	385	2	2, 264	3	2, 323
Poland	-------	-------	[1] 3	[1] 2, 194	[1] 227	[5] 4, 550	[8] 20	[5] 7, 375	-------	[5] 4, 276
Rumania	[1, 9] 63	[1, 9] 16,804	(4)	24, 714	(4)	7, 743	-------	12, 675	-------	[5] 31, 936
Russia	[1] 124	[1] 173,240	-------	14, 069	-------	3, 235	-------	36, 940	-------	20, 465
Sweden	[1] 28	[1] 102	204	19	31	540	14	523	5	1, 878
Tunis	[1] 328	[1] 3, 055	[1] 128	[5] 6, 622	[1] 523	[5] 313	[8] 48	[5] 2, 680	-------	[5] 3, 740
United States	-------	7, 896	-------	11, 209	-------	23, 653	-------	27, 181	-------	17, 044
Yugoslavia	-------	-------	-------	[1] 218	-------	[5] 1, 197	-------	[5] 1, 105	-------	[5, 10] 1, 377
PRINCIPAL IMPORTING COUNTRIES										
Austria	[1] 716	[1] 8, 123	3, 910	[1] 45	3, 890	[5, 10] 32	3, 772	[8] 355	2, 962	159
Belgium	18, 351	3, 079	12, 491	81	12, 068	103	13, 361	250	11, 635	204
Ceylon	-------	-------	[5, 10] 11	-------	[5] 12	-------	[5] 13	-------	[5] 15	-------
Cuba	255	-------	432	-------	542	-------	536	-------	[11] 115	-------
Denmark	[1] 3, 024	[1] 2, 906	10, 640	622	5, 128	3, 071	2, 914	2, 909	3, 526	2, 635
Egypt	[1] 732	[1, 12] 42	182	35	126	107	314	(4)	665	20
Estonia	-------	-------	[5] 372	-------	[5] 140	-------	[5] 273	-------	[5] 82	-------
Finland	-------	-------	273	-------	42	-------	39	-------	17	-------
France	6, 711	787	6, 728	831	2, 113	914	2, 188	698	[5] 1, 620	220
Germany	148, 297	136	23, 085	13	31, 018	2, 849	53, 090	525	97, 886	75
Greece	-------	-------	1, 368	-------	[5] 1, 498	-------	[5, 13] 16	-------	-------	-------
Irish Free State	-------	-------	-------	-------	784	100	1, 613	55	418	996
Italy	824	20	386	61	212	610	127	106	326	1
Japan	[1] 15	-------	[1] 108	-------	[5] 48	-------	[5] 42	-------	[5] 14	-------
Latvia	-------	-------	[1] 415	[1] 26	[5] 196	[1] 203	[5] 176	[8] 4	[5] 99	-------
Netherlands	[1] 38, 039	[1] 26, 975	15, 267	556	9, 293	782	14, 905	425	13, 612	590
Norway	[1] 4, 550	-------	2, 988	(4)	1, 501	(4)	1, 652	-------	1, 227	-------
Portugal	[1] 24	[1] 5	-------	-------	-------	-------	-------	-------	-------	-------
Spain	640	117	83	662	553	928	1, 560	258	1	[14] 858
Switzerland	[1] 1, 140	[1] 1	3, 101	1	2, 956	1	3, 102	(4)	2, 534	(4)
Syria and Lebanon	-------	-------	[5, 10] 64	-------	[5, 10] 466	-------	[5] 453	-------	[5] 234	-------
United Kingdom	48, 550	[2] 101	43, 676	131	41, 140	[8] 81	35, 712	[8] 492	[5] 20, 662	-------
Total, 38 countries	273, 102	280, 310	126, 235	123, 453	110, 041	110, 045	137, 948	148, 775	169, 432	160, 076

Bureau of Agricultural Economies. Official sources except where otherwise noted.

[1] Year ended July 31, as compiled in the International Yearbook of Agricultural Statistics.
[2] Average of calendar years 1909–1913.
[3] Year ended Dec. 31.
[4] Less than 500 bushels.
[5] International Crop Report and Agricultural Statistics.
[6] Average for seasons 1909–10 to 1911–12.
[7] Sea trade only.
[8] 10 months ended May 31, International Yearbook of Agricultural Statistics.
[9] Average for seasons 1911–12 to 1913–14.
[10] 11 months.
[11] 6 months.
[12] Average for seasons 1912–13 to 1913–14.
[13] 2 months.
[14] 9 months.

TABLE 87.—*Barley: Estimated price per bushel, received by producers, United States, 1909–1927*

Year beginning August	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	July 15	Weighted av.
Average:	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1909–1913	60.1	60.0	60.5	60.5	60.9	62.4	63.3	63.6	64.6	64.7	63.0	59.4	60.8
1914–1920	88.1	85.7	84.3	84.4	85.7	88.5	91.9	95.6	98.8	99.1	94.8	90.8	87.2
1921–1925	58.2	56.1	57.3	57.3	58.1	59.8	60.5	61.1	61.2	61.8	61.1	60.7	58.6
1909	57.9	54.0	53.4	53.6	55.8	58.4	59.8	60.0	58.1	56.1	54.8	54.3	55.6
1910	56.0	56.6	55.7	56.6	58.8	62.0	63.6	66.0	71.6	73.9	72.0	69.7	60.8
1911	73.2	79.4	83.3	85.9	86.6	88.8	91.1	91.6	94.2	93.6	86.5	74.4	81.9
1912	60.2	54.2	54.3	52.2	50.2	50.6	50.2	48.8	48.4	50.5	53.2	52.2	52.7
1913	53.0	56.0	55.8	54.2	53.0	52.3	51.8	51.4	50.5	49.2	48.3	46.3	53.0
1914	48.8	52.2	51.8	53.0	54.3	58.6	65.3	66.2	64.2	62.9	58.9	56.2	54.8
1915	54.3	49.4	48.4	50.8	53.2	58.3	60.6	58.4	58.4	59.6	59.4	59.3	53.8
1916	66.1	74.7	79.8	85.6	87.6	89.9	94.8	99.6	111.2	119.7	113.0	110.6	83.4
1917	112.2	112.0	112.6	112.5	120.1	129.2	146.5	165.6	164.4	147.0	126.9	114.2	122.5
1918	105.4	98.2	95.2	93.3	91.5	89.0	86.1	89.0	98.3	106.6	108.8	113.6	100.0
1919	117.2	115.4	116.2	118.8	125.4	133.6	133.2	134.6	143.2	147.4	145.2	131.5	124.9
1920	113.0	98.1	86.4	76.5	67.8	60.8	57.0	55.6	51.8	50.4	51.1	50.0	70.7
1921	48.2	46.2	43.6	41.8	42.8	44.0	47.0	51.2	54.6	57.0	55.0	51.0	48.4
1922	47.7	46.2	49.2	52.0	55.6	56.8	56.2	58.0	59.6	60.8	58.3	54.7	51.8
1923	52.2	51.9	54.7	55.2	57.6	56.5	58.0	60.0	61.0	60.0	61.9	68.8	56.8
1924	75.7	75.6	81.4	79.7	76.2	82.4	84.8	81.5	76.1	75.9	76.4	73.5	77.1
1925	67.1	60.8	57.6	58.0	58.4	59.5	56.3	54.6	54.8	55.1	53.7	55.3	58.7
1926	55.0	52.9	54.4	56.0	56.4	58.0	61.3	62.2	64.1	68.4	76.3	71.4	59.4
1927	69.0	69.5	66.8	66.8	71.5	------	------	------	------	------	------	------	--------

Bureau of Agricultural Economics. Based on returns from special price reporters. Mean of prices reported on 1st of month and 1st of succeeding month, August, 1909–December, 1923.

TABLE 88.—*Barley, No. 2: Weighted average price[1] per bushel, Minneapolis, 1909–1927*

Year beginning August	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Weighted av.[1]
Average:	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1909–1913	59	63	63	63	63	69	66	66	67	65	61	60	64
1914–1920	95	92	93	95	99	103	105	111	112	111	102	100	102
1921–1925	63	63	63	64	64	66	68	67	69	68	67	68	65
1909	45	48	49	52	57	61	60	58	54	54	53	60	54
1910	61	63	63	66	70	77	74	81	88	75	77	87	74
1911	85	94	95	98	91	105	100	95	101	99	76	60	92
1912	46	49	50	47	45	49	48	46	46	50	52	48	48
1913	58	61	56	53	50	52	50	48	47	48	47	45	51
1914	59	58	55	59	57	68	75	70	70	70	66	68	65
1915	59	48	51	56	61	70	66	65	68	70	68	69	63
1916	81	81	103	111	107	117	117	121	136	148	138	149	117
1917	131	133	128	127	149	156	188	212	182	146	123	118	149
1918	102	95	91	94	92	90	87	93	109	113	112	121	100
1919	133	127	129	133	152	152	137	151	160	174	149	116	143
1920	102	99	92	82	74	69	65	67	61	59	57	62	74
1921	58	55	50	54	47	51	56	58	61	62	56	56	55
1922	49	54	57	60	61	57	60	59	64	61	58	59	58
1923	56	58	60	61	62	62	68	70	75	70	73	76	63
1924	80	81	85	81	87	93	94	88	81	84	84	84	84
1925	72	66	65	63	65	65	62	62	63	65	64	67	67
1926	63	62	65	64	67	69	71	72	77	88	88	81	71
1927	77	72	73	77	83	------	------	------	------	------	------	------	--------

Bureau of Agricultural Economics. Compiled from Minneapolis Daily Market Record.

[1] Average of daily prices weighted by car-lot sales.

TABLE 89.—*Flaxseed: Acreage, production, value, foreign trade, net supply, etc., United States, 1879, 1889, 1899, 1902–1927*

Year	Acreage	Average yield per acre	Production	Price per bushel received by producers Dec. 1	Farm value Dec. 1	Value per acre [1]	Price per bushel of No. 1 flaxseed at Minneapolis, year beginning Sept. 1 [2]	Flaxseed, including linseed oil in terms of seed, year beginning July 1 [3]: Imports	Exports, domestic and foreign	Net imports	Net supply [4]
	1,000 acres	*Bushels of 56 lbs.*	*1,000 bushels*	*Cents*	*1,000 dollars*	*Dollars*	*Cents*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
1879			*7,171*					1,512	15	1,497	8,668
1889	*1,319*	*7.8*	*10,250*					2,397	50	2,347	12,597
1899	*2,111*	*9.5*	*19,979*				[5] 159	69	2,785	[6] 2,716	17,263
1902	3,740	7.8	29,285	105.2	30,815	8.24	113	137	4,201	[6] 4,064	25,221
1903	3,233	8.4	27,301	81.7	22,292	6.90	108	222	893	[6] 671	26,630
1904	2,264	10.3	23,401	99.3	23,229	10.26	132	305	114	191	23,592
1905	2,535	11.2	28,478	84.4	24,049	9.49	109	66	6,114	[6] 6,048	22,430
1906	2,506	10.2	25,576	101.3	25,899	10.33	118	96	6,518	[6] 6,422	19,154
1907	2,864	9.0	25,851	95.6	24,713	8.63	120	62	4,436	[6] 4,374	21,477
1908	2,679	9.6	25,805	118.4	30,577	11.41	152	605	992	[6] 387	25,418
1909	*2,083*	*9.4*	*19,513*								
1909	2,083	9.5	19,699	152.8	30,093	14.45	206	5,190	157	5,033	24,732
1910	2,467	5.2	12,718	231.7	29,472	11.95	249	12,083	71	12,012	24,730
1911	2,757	7.0	19,370	182.1	35,272	12.79	214	7,137	125	7,012	26,382
1912	2,851	9.8	28,073	114.7	32,202	11.20	138	5,364	711	4,653	32,726
1913	2,291	7.8	17,853	119.9	21,399	9.34	152	8,730	401	8,329	26,182
1914	1,645	8.4	13,749	126.0	17,318	10.53	170	10,880	552	10,328	24,077
1915	1,387	10.1	14,030	174.0	24,410	17.60	204	14,699	288	14,411	28,441
1916	1,474	9.7	14,296	248.6	35,541	24.11	291	12,438	482	11,956	26,252
1917	1,984	4.6	9,164	296.6	27,182	13.70	378	13,387	499	12,888	22,052
1918	1,910	7.0	13,369	340.1	45,470	23.81	419	8,823	455	8,368	21,732
1919	*1,261*	*5.3*	*6,653*								
1919	1,503	4.8	7,178	438.5	31,475	20.94	452	25,212	506	24,706	31,884
1920	1,757	6.1	10,752	176.7	18,999	10.81	209	16,969	226	16,743	27,495
1921	1,108	7.2	8,029	145.1	11,648	10.51	219	22,630	151	22,479	30,508
1922	1,113	9.3	10,375	211.5	21,941	19.71	258	28,033	166	27,867	38,242
1923	2,014	8.5	17,060	210.7	35,951	17.91	244	20,528	140	20,388	37,448
1924	*3,435*	*8.2*	*28,246*								
1924	3,469	9.1	31,547	227.4	71,728	20.68	263	14,677	128	14,549	46,096
1925	3,078	7.3	22,424	226.5	50,783	16.50	252	20,246	125	20,121	42,545
1926	2,907	6.7	19,335	194.0	37,510	12.90	224	24,295	146	24,149	43,484
1927 [7]	2,907	9.1	26,583	185.7	49,373	16.98					

Bureau of Agricultural Economics. Production figures are estimates of the crop-reporting board; italic figures are census returns.

1 Based on farm price Dec. 1.

2 The figures shown for 1899, 1902–1920 are averages of daily closing prices compiled from annual reports of the Minneapolis Chamber of Commerce; 1921–1925 are averages of daily prices weighted by car-lot sales, compiled from Minneapolis Daily Market Record.

3 Census years 1879–1899, 1902–1917 compiled from Commerce and Navigation of the United States; 1918 Foreign Commerce and Navigation of the United States; 1919–1927, Monthly Summary of Foreign Commerce of the United States, June issues, and official records of the Bureau of Foreign and Domestic Commerce.

4 Production minus net exports or plus net imports.

5 Average for 8 months.

6 Net exports.

7 Preliminary.

TABLE 90.—*Flaxseed: Acreage and production, by States, average 1921–1925, annual 1925–1927*

State	Acreage				Production			
	Average, 1921–1925	1925	1926	1927 [1]	Average, 1921–1925	1925	1926	1927 [1]
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*
Wisconsin	7	11	11	9	94	152	132	119
Minnesota	521	740	814	757	5, 374	7, 400	7, 652	7, 343
Iowa	8	10	15	21	82	105	174	273
Missouri	[2] 1	1	2	7	[2] 8	8	16	46
North Dakota	1, 067	1, 461	1, 380	1, 242	8, 228	9, 496	7, 590	10, 184
South Dakota	354	559	475	594	2, 774	3, 801	2, 755	5, 940
Nebraska	5	6	7	7	40	54	61	70
Kansas	33	45	38	31	222	306	262	170
Montana	159	244	165	239	1, 059	1, 098	693	2, 438
Colorado	[2] 4	1			[2] 14	4		
United States	2, 156	3, 078	2, 907	2, 907	17, 887	22, 424	19, 335	26, 583

Bureau of Agricultural Economics. Estimates of crop-reporting board.

[1] Preliminary. [2] 2-year average.

TABLE 91.—*Flaxseed: Yield per acre and estimated price per bushel, December 1, by States, average 1914–1920, 1921–1925, annual 1923–1927*

State	Yield per acre							Estimated price per bushel						
	Av., 1914–1920	Av., 1921–1925	1923	1924	1925	1926	1927	Av., 1914–1920	Av., 1921–1925	1923	1924	1925	1926	1927
	Bush.	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
Wisconsin		12. 5	12. 1	13. 0	13. 8	12. 0	13. 2		198	210	225	226	200	190
Minnesota	9. 4	10. 2	10. 0	11. 4	10. 0	9. 4	9. 7	258	209	213	233	230	197	192
Iowa	10. 0	10. 1	9. 4	11. 7	10. 5	11. 6	13. 0	240	199	210	225	220	195	195
Missouri	8. 1	[1] 8. 2		9. 0	7. 5	8. 0	6. 5		[1] 208		225	190	195	188
North Dakota	7. 2	7. 7	7. 7	8. 5	6. 5	5. 5	8. 2	260	204	212	227	226	193	184
South Dakota	8. 8	8. 0	8. 5	8. 6	6. 8	5. 8	10. 0	250	199	208	223	225	190	185
Nebraska	7. 9	8. 6	11. 0	7. 0	9. 0	8. 7	10. 0	283	201	210	225	230	185	175
Kansas	6. 1	6. 7	7. 6	6. 5	6. 8	6. 9	5. 5	241	190	215	215	200	200	185
Montana	5. 4	6. 7	8. 2	3. 7	4. 5	4. 2	10. 2	255	194	193	221	220	185	175
Colorado		[1] 3. 8		3. 0	4. 5				[1] 205		210	200		
United States	7. 2	8. 3	8. 5	9. 1	7. 3	6. 7	9. 1	257. 2	204. 2	210. 7	227. 4	226. 5	194. 0	185. 7

Bureau of Agricultural Economics. Estimates of crop-reporting board.

[1] 2-year average.

Country	Acreage					Seed production					Fiber production				
	Average, 1909–1913[1]	1924	1925	1926	1927, preliminary	Average, 1909–1913[1]	1924	1925	1926	1927, preliminary	Average, 1909–1913[1]	1924	1925	1926	1927, preliminary
NORTHERN HEMISPHERE															
NORTH AMERICA	Acres	Acres	Acres	Acres	Acres	1,000 bushels	1,000 bushels	1,000 bushels	1,000 bushels	1,000 bushels	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds
Canada	1,034,874	1,276,667	1,128,100	738,397	475,852	12,040	9,695	9,297	5,995	4,885					
United States	2,489,800	3,469,000	3,078,000	2,907,000	2,907,000	19,543	31,547	22,424	19,335	26,583					
Total North America	3,524,674	4,745,667	4,206,100	3,645,397	3,382,852	31,583	41,242	31,721	25,330	31,468					
EUROPE															
United Kingdom:															
England and Wales	480	5,743	4,390	3,515											
Northern Ireland	53,014	42,838	37,786	30,524	26,334						[3] 19,500	13,035	13,104	13,498	11,000
Irish Free State		10,359	10,658	6,802	5,998						[5] 4,200	3,017	3,413	2,567	
Sweden	[2] 4,016	5,063	5,453			[4] 14	4	4			[4] 1,128	465	544		
Netherlands	33,055	31,315	37,500	34,226	26,630	376	346	548	313		17,276	20,490	23,925	23,048	12,125
Belgium	48,930	54,461	57,836	58,592	52,081	[2] 472	464	488	468	415	[2] 51,888	35,379	51,352	76,896	65,036
France	61,666	48,510	60,831	66,383	63,282	534	417	531	328	322	40,732	33,870	44,469	33,064	48,578
Spain	[5] 7,349	(3,500)	3,000	3,000	3,000	[2] 26	(45)	45	18		[2] 1,995	(1,300)	1,370	1,573	
Italy	[2] 42,852	51,400	51,900	54,830	43,000	340	422	504	459	299	6,675	4,542	5,688	5,512	4,630
Austria	12,787	9,254	9,412	9,296	9,000	112	65	64	43	46	7,480	7,706	8,277	7,425	5,357
Czechoslovakia	61,404	54,080	61,170	54,400	53,900	435	356	416	331	418	39,143	27,046	30,137	24,330	23,234
Hungary	7,967	5,431	8,532	4,000		63	42	55	35		6,671	3,829	6,393	3,080	
Yugoslavia	32,274	32,333	32,172	30,196	32,000	161	0	0	0		22,277	18,683	22,518	18,999	
Bulgaria	756	672	596	500	700	6	4	3	3	3	382	191	197	132	159
Rumania	[4] 71,253	50,638	62,180	50,616	49,000	[4] 707	223	331	244	233	[4] 11,044	14,042	7,498	4,735	
Poland	191,710	261,958	265,850	268,100	271,000	1,703	2,240	2,441	2,814	3,031	47,336	96,222	131,912	131,311	147,700
Lithuania	143,257	151,969	200,000	200,000	208,000	1,126	1,332	1,655	1,576	1,561	49,703	71,859	91,184	81,607	85,407
Latvia	161,906	149,486	192,955	157,650	156,000	953	980	1,099	971		62,318	57,708	66,138	55,820	42,636
Estonia	135,193	75,912	112,826	83,433	88,000	733	460	489	475	409	49,518	23,684	29,983	20,425	23,343

[1] Where changes in territory have occurred averages are estimates for territory within present boundaries.
[2] 3-year average.
[3] Total production in Ireland in 1909–1913 averaged 23,700,000 pounds. Estimates have been made for the present divisions by applying to the 1909–1913 total production the percentage of the total produced by each division during the years 1922–1926.
[4] 4-year average.
[5] 2-year average.

TABLE 92.—*Flax: Acreage and production in specified countries, average 1909–1913, annual 1924–1927*—Continued

Country	Acreage					Seed production					Fiber production				
	Average, 1909–1913	1294	1925	1926	1927, preliminary	Average, 1909–1913	1924	1925	1926	1927, preliminary	Average, 1909–1913	1924	1925	1926	1927, preliminary
NORTHERN HEMISPHERE—Con.															
EUROPE—continued	*Acres*	*Acres*	*Acres*	*Acres*	*Acres*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Finland	[6] 12,236	13,054	13,472	13,600	14,000						2,700	2,804	3,536	3,383	
Russia, including Asiatic territory	3,165,082	2,960,000	3,898,100	4,167,000	4,351,000	18,934	16,508	23,730	20,472		739,990	538,363	686,072	780,038	
Total European countries reporting, all years shown, including Asiatic Russia	4,234,724	4,001,736	5,108,304	5,289,148	5,452,925	6,168	5,983	6,922	6,741	6,737	391,951	391,732	496,366	476,077	474,205
NORTH AFRICA															
Kenya		3,029	934				12					576	589		
Morocco		45,308	49,500	47,000	47,000		445	402	344	394					
Algeria	1,366	793	544	539		13	4	6			188	441	441		
Tunis	(8,000)	5,253	6,437	6,000	5,000	37	17	37	37	47					
Egypt	[5] 4,628	3,337	3,720	4,000	2,000	[6] 37	25	39	69		[6] 7,265	1,742	2,388	2,668	
Total North African countries reporting, all years shown	12,623	53,898	59,657	57,000	54,000	37	462	439	381	441					
ASIA															
India [7]	3,824,880	3,695,000	3,596,000	3,348,000		20,578	20,040	16,080	16,280						
Japanese Empire:															
Japan	12,139	37,209	52,144	45,000		[4] 98	213	271			30,003	48,487	74,045		
Chosen	3,000	3,450	3,709	3,889								1,258	1,186	1,287	
Total Northern Hemisphere countries reporting, all years shown	7,772,026	8,801,301	9,374,061	8,991,545	8,889,777	37,788	47,687	39,082	32,452	38,646	391,951	391,732	496,366	476,077	474,205
Estimated Northern Hemisphere, total	11,626,000	12,557,000	13,046,000	12,396,000		79,091	85,906	80,983	70,877		1,220,400	1,026,700	1,306,400	1,360,800	

SOUTHERN HEMISPHERE															
Chile	[4] 748	1,416	1,122	1,000		19	48	13			[4] 127	31			
Uruguay	[4] 126,528	145,960	185,100	175,117	176,946	[4] 951	1,542	2,029	1,970						
Argentina [8]	4,113,434	6,322,543	6,201,100	6,672,000	7,055,000	31,117	45,084	75,113	69,091	81,216					
Australia	[5] 1,056	140	153			[5] 9	2	1			[5] 128	2			
New Zealand	[6] 2,565	6,679	8,143	4,937			85	94	89						
Total Southern Hemisphere countries, reporting all years shown	4,239,962	6,468,503	6,386,200	6,847,117	7,231,946	31,117	45,084	75,113	69,091	81,216					
Total Northern and Southern Hemisphere countries reporting, all years shown	12,011,988	15,269,804	15,760,261	15,838,662	16,121,723	68,905	92,771	114,195	101,543	119,862	391,951	391,732	496,366	476,077	474,205
Estimated world total [9]	15,870,000	19,034,000	19,441,000	19,250,000		111,187	132,667	158,233	142,047		1,220,700	1,026,800	1,307,100	1,360,900	

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture. Estimates given are for crops harvested during the calendar year in the Northern Hemisphere and the succeeding harvest in the Southern Hemisphere with the exception of India. See note on India. Figures in parentheses are rough estimates for years for which no figures are available.

[4] 4-year average.
[5] 2-year average.
[6] 1 year only.
[7] Figures are for crop sown in autumn of year given and harvested in spring of the succeeding year.
[8] Acreage figures are for area sown. Figures of area harvested are not available for all years, but official figures for 2 years and semiofficial figures for 14 years show an average harvested area 10 per cent below the sown area, although the percentage varies widely from year to year.
[9] Excludes a few minor producing countries for which no statistics are available and which do not enter into world trade. No figures are included for Germany whose acreage in 1913 was 37,800 acres, and has now fallen from 118,000 acres in 1921 to 38,000 acres in 1927. No production figures are available.

TABLE 93.—*Flaxseed: Monthly marketings by farmers, as reported by about 3,500 mills and elevators, United States, 1917–1926*

Year beginning July	Percentage of year's receipts												
	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Season
1917	1.8	3.6	21.5	28.1	17.6	7.6	4.7	4.0	4.8	1.8	1.6	2.9	100.0
1918	1.8	2.9	14.8	21.5	15.0	10.9	5.2	4.4	5.8	4.3	5.0	8.4	100.0
1919	3.6	8.0	20.6	22.2	11.1	7.4	5.0	6.3	3.1	3.1	2.6	7.0	100.0
1920	2.1	4.7	23.6	28.6	13.0	6.2	5.0	3.3	3.1	2.1	3.4	4.9	100.0
1921	6.4	10.9	20.7	25.7	12.0	6.9	4.3	2.8	3.0	2.4	2.1	2.8	100.0
1922	2.5	13.4	27.6	23.3	11.4	5.9	4.7	3.0	2.7	2.3	1.6	1.6	100.0
1923	1.1	10.0	30.7	27.3	12.1	6.0	2.6	2.3	2.0	1.5	2.1	2.3	100.0
1924	.5	5.3	23.0	34.5	17.8	6.7	3.8	2.7	1.8	1.4	1.2	1.3	100.0
1925	1.1	11.1	34.3	23.5	12.4	5.6	2.7	2.0	1.8	1.5	1.9	2.1	100.0
1926	1.4	12.0	25.5	32.5	11.2	6.3	2.4	2.3	1.7	.9	1.7	2.1	100.0

Bureau of Agricultural Economics.

TABLE 94.—*Flaxseed: Receipts at Minneapolis, 1909–1926*

Year beginning September	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Total
	1,000 bush.	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*
Average:													
1909–1913	774	1,661	1,556	1,246	799	631	621	406	314	280	282	177	8,745
1914–1920	528	1,317	1,121	824	456	421	538	332	348	537	392	183	6,998
1921–1925	1,932	2,088	1,230	781	546	345	359	323	366	360	272	700	9,301
1909	999	2,219	1,892	601	966	670	826	437	222	159	123	137	9,251
1910	854	1,530	1,292	535	338	300	232	112	118	122	133	191	5,757
1911	563	1,212	1,570	1,716	531	459	397	468	571	440	487	160	8,574
1912	700	1,657	1,520	2,245	1,450	1,246	1,057	742	518	514	432	281	12,362
1913	756	1,686	1,505	1,131	711	478	592	270	139	165	233	117	7,783
1914	901	1,890	1,247	1,016	599	443	384	142	77	146	239	115	7,199
1915	347	1,038	1,506	1,113	319	399	810	486	440	363	441	199	7,461
1916	316	2,380	1,694	1,045	544	442	441	384	263	565	325	92	8,491
1917	265	980	1,112	614	533	553	527	283	349	648	208	94	6,166
1918	536	915	857	788	558	473	829	439	436	942	642	196	7,611
1919	753	570	568	492	344	368	409	159	295	522	554	297	5,331
1920	580	1,444	861	699	298	269	364	434	578	572	338	289	6,726
1921	500	1,144	375	354	308	200	254	198	300	220	157	288	4,296
1922	909	1,121	580	577	447	249	319	476	401	481	359	1,019	6,938
1923	2,654	1,953	1,308	877	358	250	229	210	206	296	204	269	8,964
1924	2,265	3,475	2,781	1,375	1,244	750	671	374	402	442	286	1,094	15,159
1925	3,331	2,745	1,107	722	375	276	320	357	431	360	294	830	11,148
1926 [1]	1,539	2,905	1,103	669	454	312	280	168	259	274	151	352	8,466
1927 [1]	4,411	3,943	1,141	482									

Bureau of Agricultural Economics. Compiled from annual reports of the Minneapolis Chamber of Commerce.

[1] Beginning January, 1927, figures are from the Minneapolis Daily Market Record, and are subject to revision.

TABLE 95.—*Flaxseed used in the production of oil in the United States, 1919–1926*

Year beginning Oct. 1	October–December	January–March	April–June	July–September	Total
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
1919	7,684	6,336	6,407	6,542	26,969
1920	6,341	6,343	6,332	5,812	24,828
1921	7,539	6,713	3,441	5,583	23,276
1922	8,602	8,292	8,689	8,223	33,806
1923	8,970	9,575	9,434	7,550	35,529
1924	11,530	12,516	9,128	7,822	40,996
1925	11,798	10,651	7,767	9,500	39,716
1926 [1]	11,085	11,037	8,963	9,051	40,136
1927 [1]	12,701				

Bureau of Agricultural Economics. Compiled from reports of the Bureau of the Census.

[1] Preliminary.

TABLE 96.—*Flaxseed: International trade, average 1911–1913, annual 1923–1926*

Country	Year ended Dec. 31									
	Average, 1911–1913		1923		1924		1925		1926, preliminary	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
PRINCIPAL EXPORTING COUNTRIES	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
Argentina	1	25,562	3	40,030	1	53,453	(1)	37,821	-------	65,866
British India	[2] 323	[2] 14,409	226	15,357	247	13,010	[3 4] 3	[4] 14,246	[3 4] 4	[4] 7,455
Canada	89	10,645	797	2,871	395	3,101	(1)	5,502	810	2,653
China	-------	648	-------	314	-------	209	-------	199	-------	155
Eritrea [3]	-------	-------	111	172	250	210	1	379	-------	258
Estonia	-------	-------	-------	20	101	111	11	36	(1)	196
Latvia [3]	-------	-------	270	421	408	736	576	988	316	672
Lithuania	-------	-------	-------	[3] 744	-------	734	-------	810	-------	1,014
Morocco	-------	338	-------	289	-------	283	-------	304	-------	296
Poland	-------	-------	1	45	6	264	145	370	244	56
Rumania	19	120	(1)	1	(1)	2	1	25	(1)	92
Russia	80	5,739	-------	[3] 192	[3] 6	[3] 1,175	(1)	[3] 1,914	-------	-------
Tunis	(1)	39	(1)	[3] 41	(1)	21	(1)	53	(1)	31
Uruguay	-------	994	-------	750	-------	1,110	-------	1,474	-------	2,093
PRINCIPAL IMPORTING COUNTRIES										
Australia	103	(1)	[5] 747	(1 3)	[5] 769	(1)	[5] 863	(1 5)	[5] 801	(1 3)
Austria	[6] 1,913	[6] 41	[3] 2	(1 3)	[3] 17	(1 3)	23	(1 3)	10	(1)
Belgium	9,313	5,965	2,453	176	3,694	245	3,112	283	3,662	331
Czechoslovakia	-------	-------	505	(1)	837	[3] 2	668	[3] 11	761	11
Denmark	1	-------	633	-------	865	(1)	574	-------	916	-------
Finland	110	(1)	115	-------	177	(1)	192	-------	167	-------
France	6,304	60	6,167	33	6,493	30	5,907	20	7,141	20
Germany	15,312	210	2,206	1	5,109	24	9,871	66	12,545	50
Hungary	-------	-------	2	12	13	11	31	8	82	10
Italy	1,698	1	1,470	3	2,288	1	1,836	2	2,272	1
Japan	[7] 27	[7] 27	337	1	406	1	362	(1)	288	1
Netherlands	8,741	2,488	7,743	155	11,479	165	10,221	232	12,927	231
Norway	445	-------	494	-------	605	-------	597	-------	613	-------
Spain	-------	-------	544	-------	620	-------	516	-------	613	-------
Sweden	911	7	1,204	(1)	1,212	(1)	1,335	(1)	1,547	(1)
United Kingdom	15,908	-------	15,153	-------	17,765	-------	13,521	-------	14,324	-------
United States	7,298	101	24,332	-------	16,589	-------	16,510	-------	22,550	-------
Total, 31 countries	68,596	67,394	65,515	61,028	70,352	74,898	66,876	64,743	82,593	81,492

Bureau of Agricultural Economics. Official sources except where otherwise noted.

[1] Less than 500 bushels.
[2] 2-year average.
[3] International Yearbook of Agricultural Statistics.
[4] Sea trade only.
[5] Year beginning July 1.
[6] Average for Austria-Hungary.
[7] 1 year only.

TABLE 97.—*Flaxseed: Estimated price per bushel, received by producers, United States, 1909–1927*

Year beginning September—	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	July 15	Aug. 15	Weighted av.
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
Average:													
1909–1913	167.0	166.4	163.3	161.1	166.5	172.4	173.5	154.8	175.9	171.5	169.0	170.7	165.1
1914–1920	274.8	260.7	254.9	257.7	263.2	270.8	276.9	281.0	281.1	275.5	278.8	185.8	267.1
1921–1925	198.1	201.0	203.6	210.5	221.4	231.3	234.7	234.7	237.3	228.4	220.1	213.3	207.6
1909	123.0	131.3	146.4	162.0	182.0	193.0	193.5	201.7	202.5	189.5	196.6	214.8	148.6
1910	227.2	231.8	230.6	226.4	227.5	237.3	237.6	238.2	233.4	215.3	202.4	201.4	229.8
1911	204.3	207.8	196.4	184.6	189.0	187.4	187.6	186.2	193.0	201.7	186.8	168.9	195.8
1912	155.2	140.6	124.0	110.4	107.8	114.2	116.3	114.0	115.0	114.6	116.0	123.2	127.4
1913	125.2	120.6	119.3	122.0	126.0	130.2	132.6	133.8	135.8	136.4	143.4	145.0	123.9
1914	133.4	123.0	122.4	130.4	149.2	160.8	162.8	168.6	169.6	161.0	148.6	144.0	131.6
1915	145.8	155.5	168.4	180.0	198.4	206.7	202.3	197.0	184.2	169.8	170.6	184.2	169.6
1916	194.7	217.0	241.6	249.6	252.2	253.4	259.6	283.4	299.7	288.4	274.8	287.2	233.8
1917	305.6	302.2	296.2	303.7	318.8	333.2	364.8	376.5	368.4	350.4	379.9	395.8	315.9
1918	381.0	357.4	337.0	333.9	318.9	318.8	338.0	355.0	375.4	416.7	492.4	529.0	374.2
1919	477.8	410.2	410.3	436.0	445.0	464.6	464.2	452.0	434.6	390.4	331.6	297.0	427.0
1920	285.0	259.9	208.4	170.2	160.0	153.4	146.5	134.2	135.7	145.8	154.0	163.4	217.6
1921	163.8	154.0	145.0	148.1	162.1	194.6	217.4	224.6	233.8	230.0	217.2	200.8	171.0
1922	189.1	199.4	211.0	217.8	229.9	245.4	261.6	279.5	273.1	248.4	228.8	210.4	209.5
1923	208.4	212.1	211.4	218.8	218.8	224.9	223.7	217.7	222.6	213.1	218.1	210.2	212.3
1924	201.2	210.8	222.7	235.8	271.8	275.3	267.8	244.7	251.8	246.8	227.6	229.5	220.7
1925	227.9	228.9	228.1	232.1	224.5	216.4	202.9	207.0	205.4	203.9	208.7	215.7	224.7
1926	211.3	197.5	195.5	196.4	193.0	195.7	195.1	196.1	205.7	204.7	198.4	203.7	197.4
1927	197.1	191.2	184.2	185.3	------	------	------	------	------	------	------	------	--------

Bureau of agricultural economics. Based on returns from special-price reporters. Mean of prices reported on 1st of month and 1st of succeeding month, September, 1909–December, 1923.

TABLE 98.—*Flaxseed No. 1: Average price per bushel, Minneapolis, 1909–1927*

Year beginning September	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
Average:													
1909–1913	195	190	182	182	194	196	195	198	196	189	189	196	192
1914–1920	299	280	291	292	302	301	310	307	309	302	319	326	303
1921–1925	231	233	237	248	262	273	268	274	266	255	254	240	247
1909	141	157	175	193	218	218	225	238	222	204	234	247	206
1910	266	262	261	242	260	268	260	256	247	224	210	234	249
1911	247	235	204	206	215	206	206	215	223	225	197	186	214
1912	176	160	135	125	129	134	126	129	130	131	138	147	138
1913	145	138	135	144	149	153	158	154	156	159	168	164	152
1914	151	133	145	154	183	186	191	193	195	176	167	167	170
1915	170	186	199	207	231	232	227	213	196	180	196	215	204
1916	211	254	278	284	289	281	290	318	333	311	301	346	291
1917	338	316	329	340	360	374	408	409	393	386	440	439	378
1918	409	359	377	354	341	345	375	388	412	486	594	587	419
1919	492	432	483	499	512	509	502	468	453	392	348	328	452
1920	323	283	227	206	196	182	178	158	184	186	189	201	209
1921	203	181	181	189	213	246	257	270	280	250	259	220	219
1922	228	238	248	262	280	304	307	340	294	280	270	234	258
1923	238	248	242	246	250	258	249	247	246	244	247	244	244
1924	226	240	258	284	315	312	297	279	280	268	249	254	263
1925	259	258	256	261	250	243	232	234	230	233	244	238	252
1926	233	221	222	224	223	225	222	224	234	225	223	222	224
1927	221	213	213	215	------	------	------	------	------	------	------	------	------

Bureau of Agricultural Economics. The figures shown for 1909–1920 are averages of daily closing prices compiled from Annual Reports of the Minneapolis Chamber of Commerce; 1921–1925 are average of daily prices weighted by car-lot sales, compiled from Minneapolis Daily Market Record. Data 1899–1908 available in 1924 Yearbook, p. 646, Table 125.

TABLE 99.—*Linseed oil: International trade, average 1909–1913, annual 1923–1926*

Country	Year ended Dec. 31									
	Average 1909–1913 [1]		1923		1924		1925		1926, preliminary	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
PRINCIPAL EXPORTING COUNTRIES	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Belgium	10,233	26,790	1,196	18,477	1,184	19,489	1,657	27,090	4,024	15,512
Netherlands	457	73,634	498	116,317	600	142,549	164	146,519	914	164,911
United Kingdom	58,018	58,013	9,184	84,379	5,902	68,477	38,407	56,786	31,924	51,336
PRINCIPAL IMPORTING COUNTRIES										
Argentina	886	[2] 2	555	973	739	1,108	1,015	503	[3] 716	[3] 391
Australia	12,252	--------	[4] 8,137	[4] 51	[4] 7,574	[4] 30	[4] 5,604	[4] 41	[4] 6,629	[4] 19
Austria	[5] 16,367	[5] 6,542	6,982	[3] 92	8,355	[3] 110	7,635	[3] 347	8,807	437
Brazil	8,726	--------	8,058	--------	8,853	--------	11,724	--------	[3] 10,285	--------
British India	3,430	1,967	2,001	748	2,161	545	2,139	842	2,168	414
Canada	2,279	--------	1,968	59	964	98	341	66	937	56
Chile	2,854	15	2,249	--------	2,603	--------	2,113	9	2,802	--------
Czechoslovakia	--------	--------	483	(6)	1,015	[3] 298	2,032	[3] 72	2,227	6
Denmark	(7)	(7)	359	1,081	578	67	2,110	112	1,675	30
Dutch East Indies	[8] 3,199	--------	3,580	--------	3,597	--------	4,831	--------	[3, 9] 2,557	--------
Egypt	3,647	--------	3,579	11	4,122	3	4,901	3	5,211	--------
Finland	812	--------	4,438	--------	4,358	--------	4,490	--------	5,154	--------
France	3,382	10,931	11,225	5,728	13,731	5,062	10,055	3,599	16,807	4,480
Germany	5,231	4,377	47,691	673	68,508	865	58,779	4,869	41,826	6,701
Greece	246	--------	746	[3] 1	877	--------	[3] 743	[3] 161	--------	--------
Hungary	--------	--------	3,128	133	3,649	205	3,757	53	3,841	16
Italy	1,042	165	2,357	239	4,378	266	1,139	461	1,604	434
New Zealand	4,188	--------	3,406	1	3,623	9	3,673	7	5,216	--------
Norway	1,609	[10] 53	4,347	8	3,065	[3] 55	2,328	6	3,591	27
Philippine Islands	809	--------	874	--------	839	--------	748	--------	952	--------
Sweden	933	5	57	287	368	81	387	937	905	1,019
Switzerland	7,825	16	9,574	2	12,471	11	11,047	5	13,033	25
Union of South Africa	3,449	--------	4,459	[3] 31	4,349	[3] 41	4,122	[3] 8	4,786	--------
United States	2,605	4,105	43,097	3,013	13,247	2,387	13,607	2,487	15,041	2,567
Yugoslavia	[2] 445	--------	[3] 2,041	--------	[3] 1,519	--------	[3] 2,743	[3] 27	[3] 3,663	[3] 188
Total, 28 countries	154,924	186,615	186,269	232,304	183,229	241,756	202,291	245,010	197,295	248,569

Bureau of Agricultural Economics. Official sources except where otherwise noted. Conversions made on the basis of 7.5 pounds to the gallon.

[1] International Institute of Agriculture, Oleaginous Products and Vegetable Oils.
[2] 4-year average.
[3] International Yearbook of Agricultural Statistics.
[4] Year ended June 30.
[5] Average for Austria-Hungary.
[6] Less than 500 pounds.
[7] Not separately stated.
[8] 2-year average.
[9] Java and Madura only.
[10] Includes reexports.

TABLE 100.—*Linseed oil: Average price per gallon, New York, 1910–1927*

Year beginning September	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
Average:													
1914–1920	117	112	105	106	106	106	109	114	116	118	119	123	113
1921–1925	91	90	90	91	91	94	94	95	97	96	96	96	94
1910	90	90	95	95	95	96	96	91	91	89	87	80	91
1911	87	88	84	71	74	71	70	73	73	76	77	66	76
1912	66	62	56	43	42	46	45	44	46	45	47	49	49
1913	50	47	46	48	48	48	50	51	50	50	52	59	50
1914	57	49	44	45	48	56	55	58	62	63	54	50	53
1915	52	55	60	61	66	72	77	76	75	67	63	71	66
1916	70	82	90	92	94	95	94	107	121	121	112	118	100
1917	125	118	115	121	129	129	141	157	157	157	164	188	142
1918	190	183	155	158	150	145	148	154	161	181	210	222	171
1919	204	179	175	182	177	177	180	183	169	165	152	141	174
1920	122	120	98	82	78	66	66	61	70	75	75	74	82
1921	74	68	67	67	72	82	82	84	90	84	89	87	79
1922	88	89	88	89	89	95	102	116	115	112	104	97	99
1923	90	94	92	92	92	91	93	90	94	94	98	102	94
1924	102	102	108	110	117	116	111	104	105	106	98	102	107
1925	103	[1] 99	96	95	87	85	80	81	81	84	89	90	89
1926	83	81	81	80	79	78	80	84	87	87	83	83	82
1927	80	77	77	75	------	------	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Figures for 1910–1915 from Monthly Labor Review; 1916–1918 from War Industries Board Price Bulletin; 1919–1927 from Oil, Paint, and Drug Reporter, average of weekly range.

[1] Beginning October, 1925, prices were quoted on pound basis and have been converted to price per gallon by multiplying by 7.5.

TABLE 101.—*Linseed oil meal: Average price per ton, New York, 1910–1927*

Year beginning September	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Average
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Average:													
1914–1920	51.77	51.09	51.77	52.76	54.00	52.25	51.46	49.48	47.53	48.05	50.87	54.19	51.27
1921–1925	46.20	45.02	------	------	49.63	48.40	46.64	45.10	44.40	43.71	44.03	44.73	------
1910	37.46	36.90	35.50	35.50	35.50	35.50	35.50	34.12	33.75	33.50	34.33	35.71	35.27
1911	40.00	40.75	40.12	39.00	39.65	40.17	39.75	38.80	38.10	37.30	36.57	35.50	38.81
1912	35.38	35.30	34.38	32.75	32.34	31.90	29.20	27.86	28.12	28.25	29.40	30.12	31.25
1913	32.50	32.00	31.40	31.25	31.25	31.35	31.25	31.50	31.50	32.27	32.80	34.60	31.97
1914	33.62	32.83	32.75	35.10	38.75	41.00	37.13	35.50	32.50	32.50	35.31	37.71	35.39
1915	39.70	38.75	38.50	40.50	40.60	39.50	36.63	32.86	31.50	32.12	33.00	37.00	36.72
1916	39.50	42.28	45.45	47.50	48.50	48.50	48.33	47.00	49.44	49.25	51.08	53.50	47.53
1917	53.00	54.00	54.42	57.00	58.15	58.50	58.50	57.00	52.50	50.00	52.80	51.00	54.90
1918	55.00	56.00	55.75	56.50	62.15	63.35	65.50	65.50	70.50	75.50	82.30	90.25	66.52
1919	81.58	73.80	78.75	80.75	81.50	71.75	70.40	62.50	60.00	60.00	60.00	60.00	70.09
1920	60.00	60.00	56.80	52.00	48.38	43.12	43.75	46.00	36.25	37.00	41.60	40.88	47.65
1921	46.30	40.00	40.75	48.00	51.00	51.62	55.00	49.50	47.62	49.20	46.88	45.50	47.61
1922	43.50	43.50	([1])	([1])	53.50	54.12	46.30	43.25	42.50	38.00	38.00	38.00	------
1923	45.00	45.62	43.88	45.00	43.75	42.00	42.00	40.50	40.00	39.90	43.75	45.00	43.03
1924	47.80	49.38	50.62	51.30	50.00	47.12	42.38	42.75	42.88	44.81	45.50	48.38	46.91
1925	48.38	46.60	50.00	51.00	49.88	47.12	47.50	49.50	49.00	46.62	46.00	40.75	48.20
1926	49.00	48.25	47.50	47.50	45.25	45.00	44.80	44.00	46.00	46.80	46.81	48.55	46.62
1927	48.88	48.62	49.10	49.50	------	------	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Compiled from Annual Statistical Review of the New York Produce Exchange, September, 1910–December, 1919; subsequently from the Oil, Paint, and Drug Reporter, average of the weekly range.

[1] Nominal.

TABLE 102.—*Rice, rough: Acreage, production, value, exports, etc., United States, 1879, 1889, 1899, 1904–1927*

Year	Acreage	Average yield per acre	Production	Price per bushel received by producers Dec 1	Farm Value Dec 1	Value per acre [1]	Foreign trade, mostly cleaned rice, but including rice bran, meal, and broken rice, year beginning July 1 [2]: Domestic exports [3]	Shipments from United States to Alaska, Hawaii, and Porto Rico	Imports	Net balances [4]
	1,000 acres	*Bush. of 45 lbs.*	*1,000 bushels*	*Cents*	*1,000 dollars*	*Dollars*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
1879	*174*	*22.7*	*3,962*				7		2,052	−1,729
1889	*161*	*28.7*	*4,626*				133		4,465	−4,095
1899	*342*	*26.3*	*9,003*				1,478		4,200	−2,064
1904	662	31.9	21,096	65.8	13,892	20.98	4,078	3,297	3,833	+3,873
1905	482	28.2	13,607	95.2	12,956	26.88	1,373	3,505	5,996	−716
1906	575	31.1	17,855	90.3	16,121	28.04	1,086	3,734	7,546	−2,444
1907	627	29.9	18,738	85.8	16,081	25.65	1,024	2,989	7,660	−3,321
1908	655	33.4	21,890	81.2	17,771	27.13	738	3,391	8,024	−3,631
1909	*610*	*35.8*	*21,839*							
1909	610	33.8	20,607	79.5	16,392	26.87	964	4,276	8,114	−2,581
1910	723	33.9	24,510	67.8	16,624	22.99	1,082	4,606	7,516	−1,605
1911	696	32.9	22,934	79.7	18,274	26.26	1,420	4,890	6,842	−157
1912	723	34.7	25,054	93.5	23,423	32.40	1,401	4,806	7,996	−1,332
1913	827	31.1	25,744	85.8	22,090	26.71	807	5,244	10,447	−3,756
1914	694	34.1	23,649	92.4	21,849	31.48	2,789	4,640	9,979	−419
1915	803	36.1	28,947	90.6	26,212	32.64	4,391	5,191	9,516	+2,051
1916	869	47.0	40,861	88.9	36,311	41.78	6,529	5,818	7,778	+6,167
1917	981	35.4	34,739	189.6	65,879	67.16	7,069	4,878	16,418	−1,148
1918	1,119	34.5	38,606	191.8	74,042	66.17	6,953	5,995	13,094	+7,638
1919	*911*	*38.8*	*35,331*							
1919	1,063	39.5	41,985	266.6	111,913	105.28	17,402	5,547	6,477	+10,948
1920	1,336	39.0	52,066	119.1	62,036	46.43	15,871	6,614	3,485	+21,217
1921	921	40.8	37,612	95.2	35,802	38.87	19,494	7,179	2,650	+25,952
1922	1,055	39.2	41,405	93.1	38,562	36.55	13,344	8,290	2,503	+20,308
1923	895	37.7	33,717	110.2	37,150	41.51	8,199	9,094	1,376	+16,116
1924	*744*	*39.7*	*29,526*							
1924	850	38.2	32,498	138.5	45,009	52.95	4,033	8,152	2,076	+10,687
1925	889	37.5	33,309	153.8	51,232	57.63	1,734	8,049	4,679	+5,602
1926	1,034	40.4	41,730	109.6	45,722	44.22	10,942	8,743	2,476	+17,654
1927 [5]	989	40.7	40,231	93.8	37,728	38.15				

Bureau of Agricultural Economics. Production figures are estimates of the crop-reporting board; italic figures are census returns.

[1] Based on farm price Dec. 1.
[2] Data for 1879–1917 compiled from Commerce and Navigation of the United States; 1918 from Foreign Commerce and Navigation of the United States; 1919–1926 from Monthly Summary of Foreign Commerce of the United States, June issues; 1927 from Jan. and June issues.
[3] No rice bran, meal, or polish reported prior to 1884.
[4] The difference between the total exports (i. e., domestic exports plus reexports plus shipments to Alaska, Hawaii, and Porto Rico) and total imports.
[5] Preliminary.

TABLE 103.—*Rice, rough: Acreage and production, by States, average 1921–1925, annual 1925–1927*

State	Acreage: Average 1921–1925	Acreage: 1925	Acreage: 1926	Acreage: 1927 [1]	Production: Average 1921–1925	Production: 1925	Production: 1926	Production: 1927 [1]
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
Missouri	[2] 2	4	10	3	[2] 175	300	610	75
South Carolina	7	5	5	5	147	80	85	90
Georgia	3	3	3	3	64	51	60	48
Mississippi	1	1	1	1	17	18	18	25
Arkansas	151	175	199	175	6,765	7,525	10,547	7,438
Louisiana	480	430	501	481	16,677	14,319	16,282	17,316
Texas	163	168	166	161	5,962	6,216	6,142	6,279
California	115	103	149	160	5,965	4,800	7,986	8,960
United States	922	889	1,034	989	35,708	33,309	41,730	40,231

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

[1] Preliminary. [2] 2-year average.

TABLE 104.—*Rice: Acreage, yield per acre and production in specified countries, average 1909–1913, annual 1924–1927*

Country	Acreage					Yield per acre					Production, in terms of cleaned rice				
	Average, 1909–1913	1924	1925	1926	1927, preliminary	Average, 1909–1913	1924	1925	1926	1927, preliminary	Average, 1909–1913	1924	1925	1926	1927, preliminary
NORTHERN HEMISPHERE	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Pounds*	*Pounds*	*Pounds*	*Pounds*	*Pounds*	*1,000,000 pounds*	*1,000,000 pounds*	*1,000,000 pounds*	*1,000,000 pounds*	*1,000,000 pounds*
United States	716	850	889	1,034	989	922	1,062	1,040	1,121	1,130	660	903	925	1,159	1,118
Mexico	[1] 66	90	112	118		[1] 515	900	795	847		[1] 34	81	89	100	
Hawaii	[1] 9	6	6	4							[1] 26		18		
Central and South America and West Indies:															
Guatemala		5	2	2	4						[2] 2	2	1	1	2
Salvador		12	13								[1] 9	14	25		
Costa Rica	[1] 7	19	17				263	353				5	6		
Colombia	[3] 15	42	42	44		[3] 1,133	476	500	500		[3] 17	20	21	22	
Ecuador												14			
British Guiana	36	29	29	49		1,500	1,931	1,793	1,347		54	56	52	66	
Dutch Guiana				28					1,036		2	17	18	29	
Porto Rico	[1] 16					[1] 250					[1] 4				
Trinidad and Tobago	[4] 12	8	8									3	3		
Europe:															
France	1										2				
Spain	94	116	120	122	128	3,191	3,466	3,467	3,566	2,578	300	402	416	435	330
Portugal	[3] 17			38		[3] 1,353			632		[3] 23	26	23	24	
Italy	358	340	356	366	351	1,804	2,365	2,452	2,527	2,715	646	804	873	925	953
Yugoslavia	[5] 5	4	3	3	4						[5] 3	3	2	2	
Bulgaria	7	12	16	13	12			1,000			9	13	16	17	15
Russia (northern Caucasia)	[2] 2										1				
French West Africa:															
French Guinea		1,977	2,039	2,051			551	551	621			1,089	1,123	1,274	
French Senegal		124	124				548	548				68	68		
Sudan															
Upper Volta		40	44				125	136				5	6		
Sierre Leone	[6] 250	400	400			[6] 828	932	932			[6] 207	373	373		
Egypt	257	256	143	237		2,132	1,605	1,657			548	411	237		
Asia:															
Turkey [7]	[1] 153	44	87	133		[1] 1,118					[1] 171				
India	67,004	81,328	82,378	77,128	74,857	957	856	833	856		64,144	69,657	68,627	66,033	
Andaman and Nicobar		4	3	3								3	3	3	
British North Borneo	[6] 64	67	74	71		[6] 594	507	865	648		[6] 38	34	64	46	
Brunei		2	5	4								1	3	2	
French establishments in India	40	43	46	44		650	651	587	614		26	28	27	27	

Russia (Transcaucasia and Turkestan)	572					584					334				
China															
Japanese Empire—															
Japan	7,300	7,701	7,729	7,740	7,774	2,163	2,332	2,427	2,256	2,510	15,787	17,960	18,756	17,462	19,509
Chosen (Korea)	2,905	3,862	3,885	3,892	3,416	1,134	1,075	1,195	1,235	1,579	3,293	4,153	4,641	4,807	5,393
Taiwan (Formosa)	1,193	1,311	1,361	1,402	1,445	1,184	1,456	1,488	1,392		1,413	1,909	2,025	1,952	
Kwantung	1	6	7								1	5	3		
French Indo-China	[2] 8,550	11,762	12,533	12,805		[2] 858	663	626	646		[2] 7,332	7,801	7,841	8,276	
Siam	4,555	6,862	6,762	7,195		935	988	851	1,041		4,258	6,779	5,752	7,488	
Federated Malay States	[2] 124	182	174			[2] 637	857	638			[2] 79	156	111		
Unfederated Malay States		424	419				705	566				299	237		
Straits Settlements	93	70	72				1,086	944				76	68		
Philippine Islands	2,817	4,264	4,341			431	661	681			1,213	2,818	2,955	2,801	
Ceylon	695	800	800	830	830	587	658	648	594	573	408	526	518	493	476
SOUTHERN HEMISPHERE															
Peru	[2] 131					[1] 641					[2] 84				
Brazil		1,344	1,324				737	699			[1] 90	991	925	921	
Paraguay	[6] 1										[6] 1				
Argentina	[2] 8	13	13								[2] 8	16	13		
Belgian Congo		33	37				212	216				7	8		
Madagascar	[5] 1,009	1,285	1,285	1,357	1,441	[8] 888	1,165	1,101	601	963	[8] 896	1,497	1,415	816	1,388
Java and Madura:															
Irrigated	5,953	7,403	7,193	7,289		1,005	956	928	975		5,983	7,076	6,677	7,108	
Nonirrigated	[9] 950	955	951	1,103		[9] 474	509	533	538		[9] 450	486	507	593	
Total Java and Madura	6,900	8,358	8,144	8,392		932	905	882	918		6,433	7,562	7,184	7,701	
Fiji Islands	[8] 12	10	10								[8] 23	5	3		
Total 8 countries reporting acreage and production all periods listed	13,084	14,966	15,080	15,354	14,941	1,681	1,755	1,828	1,701	1,953	21,999	26,258	27,560	26,114	29,182
Estimated world total exclusive of China[10]											109,000	127,000	126,000	125,000	

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture. Yields have not been calculated when total acreage is below 15,000 acres. Acreage and production figures in most cases are for crops harvested in the calendar year in the Northern Hemisphere and the succeeding harvest in the Southern Hemisphere.

[1] 1 year only. [2] 2-year average. [3] Year 1915. [4] 4-year average. [5] Pre-war average. [6] Year 1914. [7] European Turkey included.
[8] 3-year average.
[9] Rough estimate for nonirrigated rice.
[10] Unofficial estimates of the Chinese crop are as follows: 70,219,000,000 pounds in 1917; 52,788,000,000 pounds in 1920; and 50,056,000,000 pounds in 1923.

TABLE 105.—*Rice, rough: Yield per acre and estimated price per 100 pounds, December 1, by States, average 1914–1920, 1921–1925, annual 1923–1927*

State	Yield per acre							Estimated price per 100 pounds						
	Av. 1914–1920	Av. 1921–1925	1923	1924	1925	1926	1927	Av. 1914–1920	Av. 1921–1925	1923	1924	1925	1926	1927
	Bush.	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*
Missouri	------	[1] 62.5	------	50.0	75.0	61.0	25.0	-----	[1] 3.11	-----	3.11	3.11	2.44	2.00
South Carolina	23.0	21.2	25.0	14.0	16.0	17.0	18.0	3.98	2.64	2.67	3.11	2.78	2.67	2.59
Georgia	26.2	21.4	22.7	17.0	17.0	20.0	16.0	3.60	2.78	2.93	3.11	3.22	2.44	2.67
Mississippi	28.0	17.0	18.0	10.0	18.0	18.0	25.0	3.11	2.62	2.56	3.02	2.44	2.67	2.00
Arkansas	44.7	45.2	39.5	42.0	43.0	53.0	42.5	3.24	2.58	2.49	3.07	3.33	2.22	2.00
Louisiana	34.8	34.7	33.5	34.6	33.3	32.5	36.0	3.29	2.53	2.38	3.02	3.40	2.33	1.93
Texas	33.9	36.9	40.0	40.0	37.0	37.0	39.0	3.40	2.58	2.55	2.78	3.31	2.44	1.91
California	60.5	51.5	53.5	48.5	46.6	53.6	56.0	3.24	3.00	2.49	3.69	3.78	2.91	2.55
United States	37.9	38.7	37.7	38.2	37.5	40.4	40.7	3.30	2.63	2.45	3.08	3.42	2.44	2.08

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

[1] 2-year average.

TABLE 106.—*Rice, in terms of cleaned rice: World production, 1909–1927*

Year	Estimated world production, exclusive of China	Production in chief producing countries [1]							
		India	Japan	Indo-China	Java and Madura [2]	Siam [3]	Chosen	Philippines	United States
	1,000,000 pounds	*1,000,000 pounds*	*1,000,000 pounds*	*1,000,000 pounds*	*1,000,000 pounds*	*1,000,000 pounds*	*1,000,000 pounds*	*1,000,000 pounds*	*1,000,000 pounds*
1909	107,000	63,869	16,474	---------	5,723	3,734	2,343	1,164	572
1910	106,000	64,552	14,650	---------	5,738	3,466	3,269	1,267	681
1911	109,000	63,943	16,246	---------	6,170	4,533	3,634	717	637
1912	109,000	63,802	15,778	6,614	5,842	4,561	3,413	1,512	696
1913	113,000	64,555	15,789	8,051	6,440	4,994	3,804	1,404	715
1914	113,000	61,109	17,909	9,521	6,339	4,708	4,439	1,100	657
1915	124,000	73,315	17,569	7,921	6,451	4,786	4,036	1,289	804
1916	129,000	78,521	18,363	6,733	6,409	5,011	4,377	1,745	1,135
1917	132,000	80,638	17,142	6,313	6,742	5,133	4,261	2,213	965
1918	105,000	54,526	17,185	6,302	6,409	4,642	4,765	2,089	1,072
1919	123,000	71,743	19,106	6,532	7,435	3,114	3,974	2,247	1,166
1920	117,000	61,963	19,858	6,284	6,250	5,868	4,639	2,565	1,446
1921	127,000	74,278	17,336	7,931	5,624	5,806	4,500	2,681	1,045
1922	133,000	75,524	19,067	7,893	6,864	5,954	4,717	2,703	1,150
1923	118,000	63,164	17,418	7,206	6,832	6,034	4,767	2,571	987
1924	127,000	69,657	17,960	7,801	7,076	6,779	4,153	2,818	903
1925 [4]	126,000	68,627	18,756	7,841	6,677	5,752	4,641	2,955	925
1926 [4]	125,000	66,033	17,462	8,276	7,108	7,488	4,807	2,801	1,159
1927 [4]	---------	---------	19,509	---------	---------	---------	5,393	---------	1,118

Bureau of Agricultural Economics. The figures for each year include the crop harvested in the Northern Hemisphere within the calendar year and the following harvest in the Southern Hemisphere. Estimates of world rice production for the period 1900–1909 appear in Agriculture Yearbook, 1924, p. 653.

[1] China is an important producing country, but official statistics are not available.
[2] Irrigated rice.
[3] Estimated figures obtained by multiplying acreage under rice as classified for revenue purposes up to 1912, and acreage as reported by the Department of Land and Agriculture from 1912 on by an average yield for the years 1920–1923, for which years official estimates have been published of areas, yield, and total production.
[4] Preliminary.

TABLE 107.—*Rice, rough: Receipts at New Orleans, 1909–1927*

Year beginning August	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Total
	1,000 lbs.	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
1909	46,004	52,219	35,185	19,112	12,556	24,583	13,812	10,170	5,661	13,239	10,545	1,428	244,514
1910	28,948	51,977	27,521	17,868	18,891	17,678	9,254	8,294	9,354	10,377	3,807	4,972	208,941
1911	18,470	37,853	37,781	31,091	13,203	21,995	17,439	4,652	953	627	83	3,235	187,382
1912	18,169	30,103	30,748	38,071	30,829	12,846	2,601	1,832	419	1,086	4,042	3,322	174,068
1913	33,577	25,420	18,910	31,763	23,714	24,147	17,166	7,301	7,957	4,253	1,728	1,223	197,159
1914	31,623	36,413	24,732	34,707	31,503	10,054	14,046	6,277	759	579	1,640	1,376	193,709
1915	27,210	48,168	32,322	40,948	14,217	20,335	11,830	13,744	7,639	1,850	234	158	218,655
1916	35,959	46,698	41,009	37,791	18,349	5,021	15,140	23,733	10,503	1,938	1,717	1,618	239,476
1917	26,057	41,326	40,425	28,849	9,662	5,531	9,528	21,534	9,081	4,917	305	733	197,948
1918	20,719	55,998	26,574	16,157	12,440	14,944	14,503	8,270	8,842	7,770	3,786	2,709	192,712
1919	18,766	43,507	33,548	18,097	24,829	20,983	9,820	7,459	8,440	7,255	8,838	5,339	206,881
1920	27,889	40,123	45,620	33,881	21,366	18,338	8,253	23,160	20,417	36,841	19,382	14,057	309,327
1921	35,893	28,138	23,169	13,598	31,345	16,987	16,463	37,710	13,859	3,926	3,397	2,653	227,138
1922	15,545	28,886	41,076	31,446	22,092	14,070	8,308	2,813	15,605	3,195	6,383	7,035	196,454
1923	7,008	16,021	19,400	19,015	17,523	14,069	5,163	6,294	1,549	995	109	120	107,266
1924	13,587	28,232	31,274	26,869	19,202	12,882	12,034	2,130	2,320	1,027	1,484	1,038	152,169
1925	20,910	20,840	14,115	12,790	22,898	19,758	11,077	6,442	6,009	2,774	1,238	1,828	140,679
1926	6,937	19,755	17,057	13,664	14,618	13,554	7,852	12,847	2,108	4,843	7,847	3,921	125,003
1927	23,399	14,604	19,357	7,213	7,299	------	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Converted from quotations on 162-pound sacks as published in annual report of New Orleans Board of Trade.

TABLE 108.—*Rice, rough: Wholesale price per 100 pounds, New Orleans, 1909–1927*

Year beginning August—	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Average
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1909	2.16	1.84	1.73	1.70	1.62	1.88	1.70	1.54	1.79	1.77	1.57	2.41	1.81
1910	1.73	1.41	1.41	1.46	1.50	1.54	1.42	1.52	1.33	1.45	1.39	1.70	1.49
1911	1.74	1.54	1.65	1.72	1.64	1.80	2.04	2.17	2.42	2.36	2.19	2.64	1.90
1912	2.21	2.09	1.64	1.98	2.09	2.18	2.22	2.16	1.82	2.23	2.01	2.11	2.06
1913	2.31	2.10	1.95	2.47	1.70	1.91	1.67	1.36	1.62	1.93	1.90	2.09	1.92
1914	2.67	2.41	1.64	1.70	2.09	1.96	2.22	2.27	2.31	2.20	2.19	2.09	2.15
1915	1.98	1.77	1.64	1.93	1.74	1.72	2.07	2.20	2.23	1.69	------	1.91	------
1916	2.41	1.89	1.96	2.12	2.04	2.05	2.18	2.30	3.09	3.91	3.40	3.95	2.61
1917	4.09	4.01	3.70	4.25	4.38	4.48	4.71	5.13	4.75	5.27	4.86	4.40	4.50
1918	4.44	4.32	3.86	3.78	3.86	3.63	------	------	------	4.56	------	6.10	------
1919	8.02	5.86	5.17	5.23	5.17	6.49	------	------	5.94	5.48	6.10	------	------
1920	3.94	3.63	2.93	2.93	------	------	1.79	1.86	------	1.90	1.78	1.72	------
1921	2.17	2.23	2.21	2.00	------	2.54	2.21	2.48	2.07	1.90	2.25	2.48	------
1922	2.40	1.85	1.92	2.47	2.21	2.20	2.10	2.49	------	2.01	2.46	------	------
1923	2.74	2.44	2.40	2.58	2.64	2.48	2.49	2.86	2.99	2.62	------	------	------
1924	2.95	2.60	2.76	3.10	3.78	3.58	------	------	3.42	3.09	3.67	3.67	------
1925	3.42	2.80	2.78	2.91	3.28	3.07	2.77	2.78	2.78	3.14	2.93	------	------
1926	------	2.47	2.17	2.12	------	2.31	1.70	------	------	1.78	2.09	------	------
1927	2.16	2.19	2.42	------	------	------	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Converted from price per 162 pounds, published in annual reports of the New Orleans Board of Trade.

TABLE 109.—*Rice: International trade, average 1909–1913, annual 1923–1926*

Country	Year ended Dec. 31									
	Average, 1909–1913		1923		1924		1925		1926, preliminary	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
PRINCIPAL EXPORTING COUNTRIES	*1 000 000 pounds*	*1 000 000 pounds*	*1 000 000 pounds*	*1 000 000 pounds*	*1 000 000 pounds*	*1 000 000 pounds*	*1 000 000 pounds*	*1 000 000 pounds*	*1 000 000 pounds*	*1 000 000 pounds*
Brazil	25	([1])	([1])	75	43	14	164	1	[2] 6	16
British India	278	5,338	349	4,554	391	5,120	181	5,588	187	5,227
French Indo-China	([1])	2,288	([1])	2,821	([1])	[2] 1,969	([1])	[3] 2,369	([1])	4,164
Italy	4	142	3	190	4	378	1	354	1	401
Madagascar	([1])	[2] 14	([1])	114	([1])	212	([1])	93	([1])	49
Siam [3]	--------	1,929	([1])	2,894	([1])	2,497	([1])	2,975	--------	--------
Spain	5	18	([1])	149	([1])	116	1	100	([1])	142
United States	210	16	49	349	41	155	68	67	117	117
PRINCIPAL IMPORTING COUNTRIES										
Argentina	93	6	103	([1])	98	1	149	1	[2] 127	([1])
Austria	[4] 183	([1] [4])	48	1	51	([1])	58	([1])	54	([1])
Blegium	181	100	80	2	82	2	89	3	83	4
British Malaya	[2] 1,100	[2] 1,299	1,269	456	1,308	420	1,466	547	1,096	621
Canada	32	2	53	2	37	3	45	2	37	2
Ceylon	822	--------	881	([1])	877	([1])	969	([1])	1,030	([1])
China	705	--------	1,846	5	1,760	6	1,685	5	2,493	4
Cuba	262	--------	443	--------	445	--------	424	--------	216	--------
Czechoslovakia	--------	--------	92	([1])	114	([1])	111	([1])	110	([1])
Dutch East Indies	1,178	132	921	65	995	89	1,178	68	[2] 1,367	[2] 67
Egypt	99	54	113	24	40	73	98	62	97	40
France	518	79	647	78	431	67	507	94	478	104
Germany	914	397	347	5	913	462	1,175	449	766	344
Hong Kong	--------	--------	2,628	2,286	2,188	1,760	[5] 1,429	[5] 1,175	--------	--------
Hungary	--------	--------	16	([1])	44	([1])	32	1	12	4
Japan	656	62	590	10	1,089	8	1,714	29	768	14
Mauritius	133	[6, 7] 1	138	--------	98	--------	[2] 135	([1])	[2] 117	([1])
Netherlands	779	476	187	51	252	149	296	234	330	285
Philippine Islands	413	([1])	146	1	333	([1])	223	1	155	1
Russia	250	6	[2] 15	--------	[2] 124	[2] 3	195	([1])	[2] 114	1
United Kingdom	769	91	313	23	320	22	294	19	237	16
Total, 29 counties	9,609	12,450	11,268	14,155	12,078	13,526	12,687	14,237	10,601	11,624

Bureau of Agricultural Economics. Official sources except where otherwise noted. Mostly cleaned rice. Under rice is included paddy, unhulled, rough, cleaned, polished, broken, and cargo rice, in addition to rice flour and meal. Rice bran is not included. Rough rice, or paddy, where specifically reported, has been reduced to terms of cleaned rice at the ratio of 162 pounds of rough or unhulled to 100 pounds of cleaned. "Rice, other than whole or cleaned rice," in the returns of the United Kingdom is not considered paddy, since the chief sources of supply indicate that it is practically all hulled rice. Cargo rice, a mixture of hulled and unhulled, is included without being reduced to terms of cleaned. Broken rice and rice flour and meal are taken without being reduced to terms of whole cleaned rice.

[1] Less than 500,000 pounds.
[2] International Yearbook of Agricultural Statistics.
[3] Fiscal year, Apr. 1–Mar. 31.
[4] Average for Austria-Hungary.
[5] 6 months.
[6] 2-year average.
[7] 1 year only.

TABLE 110.—*Rice, Blue Rose: Average price per 100 pounds, New Orleans, 1914–1927* [1]

Year beginning August—	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Average
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Average—													
1914–1920	------	------	5.20	5.04	4.85	4.95	5.03	5.27	5.54	5.72	6.01	6.34	------
1921–1925	4.71	4.75	4.62	4.80	4.80	4.88	4.98	5.01	5.03	5.03	5.39	5.47	4.95
1914	------	------	3.62	3.06	3.16	3.56	3.75	3.50	4.10	4.06	3.47	3.88	------
1915	3.88	3.38	3.06	2.87	2.97	2.75	3.06	3.38	3.56	3.68	3.81	3.40	3.32
1916	3.40	3.31	3.00	3.31	3.16	3.18	3.31	3.87	4.94	6.18	6.13	6.25	4.17
1917	4.75	6.81	6.32	6.56	5.94	6.41	6.46	7.56	8.19	8.94	8.90	8.94	7.15
1918	7.88	6.75	6.56	6.44	6.06	5.94	5.94	5.82	5.63	5.25	8.00	10.82	6.76
1919	------	9.00	8.44	8.44	9.25	9.81	10.19	10.38	10.12	9.50	9.19	8.00	------
1920	7.25	6.25	5.38	4.62	3.44	3.00	2.50	2.38	2.25	2.40	2.56	3.06	3.76
1921	3.19	3.50	3.78	3.69	3.12	3.10	3.18	3.44	3.56	3.60	4.31	4.38	3.57
1922	4.10	4.25	3.62	3.82	4.00	4.06	3.94	3.91	4.00	3.56	3.75	3.94	3.91
1923	3.78	4.00	4.88	4.66	4.38	4.62	4.69	5.06	5.06	5.88	6.12	6.19	4.94
1924	5.88	5.69	5.12	5.50	6.10	6.30	6.50	6.38	6.34	6.50	6.81	6.88	6.17
1925	6.62	6.31	5.69	6.34	6.41	6.31	6.59	6.25	6.19	5.60	5.94	5.94	6.18
1926	4.94	5.62	4.81	4.44	4.38	4.50	4.19	4.34	4.06	4.12	4.52	4.22	4.51
1927	4.12	4.12	3.84	3.62	3.69	------	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Compiled from annual reports of the New Orleans Board of Trade.

[1] Quotations are for clean fancy.

TABLE 111.—*Buckwheat: Acreage, production, value, exports, etc., United States, 1849, 1859, 1866–1927*

Year	Acreage	Average yield per acre	Production	Price per bushel received by producers Dec. 1	Farm value Dec. 1	Value per acre [1]	Foreign trade, including flour, year beginning July 1 [2]		
							Domestic exports	Imports	Net balance [3]
	1,000 acres	*Bush. of 48 lbs.*	*1,000 bushels*	*Cents*	*1,000 dollars*	*Dollars*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
1849	----------	----------	*8,957*	----------	----------	----------	----------	----------	----------
1859	----------	----------	*17,572*	----------	----------	----------	----------	----------	----------
1866	1,046	21.8	22,792	67.6	15,413	14.74	----------	----------	----------
1867	1,228	17.4	21,359	78.7	16,812	13.69	----------	----------	----------
1868	1,114	17.8	19,864	78.0	15,490	13.90	----------	----------	----------
1869	----------	----------	*9,822*	----------	----------	----------	----------	----------	----------
1869	1,029	16.9	17,431	71.9	12,535	12.18	----------	----------	----------
1870	537	18.3	9,842	70.5	6,937	12.92	----------	----------	----------
1871	414	20.1	8,329	74.5	6,208	15.00	----------	8	−8
1872	448	18.1	8,134	73.5	5,979	13.35	----------	19	−19
1873	454	17.3	7,838	75.0	5,879	12.95	----------	14	−14
1874	453	17.7	8,017	72.9	5,844	12.90	----------	10	−10
1875	576	17.5	10,082	62.0	6,255	10.86	----------	4	−4
1876	666	14.5	9,669	66.6	6,436	9.66	----------	7	−7
1877	650	15.7	10,177	66.9	6,808	10.47	----------	11	−11
1878	673	18.2	12,247	52.6	6,441	9.57	----------	6	−6
1879	*848*	*13.9*	*11,817*	----------	----------	----------	----------	----------	----------
1879	848	20.7	17,530	60.3	10,575	12.47	----------	26	−26
1880	823	17.8	14,618	59.4	8,682	10.55	----------	4	−4
1881	829	11.4	9,486	86.5	8,206	9.90	----------	116	−116
1882	847	13.0	11,019	73.0	8,039	9.49	----------	154	−154
1883	857	8.9	7,669	82.2	6,304	7.36	----------	146	−146
1884	879	12.6	11,116	58.9	6,549	7.45	----------	63	−63
1885	914	13.8	12,626	55.9	7,057	7.72	----------	77	−77
1886	918	12.9	11,869	54.5	6,465	7.04	----------	74	−74
1887	911	11.9	10,844	56.5	6,122	6.72	----------	19	−19
1888	913	13.2	12,050	63.3	7,628	8.36	----------	56	−56
1889	*837*	*14.5*	*12,110*	----------	----------	----------	----------	----------	----------
1889	837	14.5	12,109	50.5	6,115	7.31	----------	36	−36
1890	863	14.7	12,678	57.3	7,264	8.42	----------	7	−7
1891	867	15.0	13,013	57.0	7,423	8.56	----------	1	−1
1892	890	14.1	12,643	52.0	6,573	7.31	----------	1	−1
1893	873	14.7	12,866	58.3	7,503	8.59	----------	294	−294
1894	864	15.9	13,721	55.7	7,638	8.84	----------	107	−107
1895	842	19.9	16,748	45.3	7,583	9.01	----------	2	−2
1896	853	18.5	15,805	39.3	6,211	7.28	1,677	4	+1,673
1897	838	20.6	17,260	42.1	7,259	8.66	1,370	4	+1,366
1898	811	17.2	13,961	45.0	6,278	7.74	1,534	3	+1,531

[1] Based on farm price Dec. 1.
[2] 1849, 1859, 1866–1917 compiled from Commerce and Navigation of the United States; 1918, Foreign Commerce and Navigation of the United States; 1919–1927, Monthly Summary of Foreign Commerce of the United States, June issues, and January and June issues, 1927. Buckwheat flour converted to terms of grain on the basis that 1 barrel of flour is the product of 7 bushels of grain.
[3] The difference between total exports (i. e., domestic exports plus reexports) and total imports.

TABLE 111.—*Buckwheat: Acreage, production, value, exports, etc., United States, 1849, 1859, 1866–1927*—Continued

Year	Acreage	Average yield per acre	Production	Price per bushel received by producers Dec. 1	Farm value Dec. 1	Value per acre	Foreign trade, including flour, year beginning July 1: Domestic exports	Foreign trade: Imports	Foreign trade: Net balance
	1,000 acres	*Bush. of 48 lbs.*	*1,000 bushels*	*Cents*	*1,000 dollars*	*Dollars*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
1899	*807*	*13.9*	*11,234*						
1899	807	16.1	13,001	55.9	7,263	9.00	427	3	+424
1900	795	14.9	11,810	55.8	6,588	8.29	123	2	+121
1901	852	18.4	15,693	56.4	8,857	10.40	720	2	+718
1902	856	17.9	15,286	59.6	9,110	10.64	118	5	+113
1903	870	17.5	15,248	60.8	9,277	10.66	31	5	+26
1904	876	18.6	16,327	62.5	10,208	11.65	316	4	+31
1905	840	18.8	15,797	58.6	9,261	11.02	697	3	+694
1906	865	18.2	15,734	59.7	9,386	10.85	199	1	+198
1907	838	17.7	14,858	70.0	10,397	12.41	116	30	+86
1908	853	19.4	16,541	75.7	12,518	14.68	187	21	+166
1909	*878*	*16.9*	*14,849*						
1909	878	20.5	17,983	70.2	12,628	14.38	158	11	+147
1910	860	20.5	17,598	66.1	11,636	13.53		92	−92
1911	833	21.1	17,549	72.6	12,735	15.29		21	−21
1912	841	22.9	19,249	66.1	12,720	15.12	1	64	−63
1913	805	17.2	13,833	75.5	10,445	12.98	1	206	−205
1914	792	21.3	16,881	76.4	12,892	16.28	414	259	+155
1915	769	19.6	15,056	78.7	11,843	15.40	515	402	+113
1916	828	14.1	11,662	112.7	13,147	15.88	260	266	−6
1917	924	17.3	16,022	160.0	25,631	27.74	6	510	−504
1918	1,027	16.5	16,905	166.5	28,142	27.40	119	413	−294
1919	*743*	*17.1*	*12,690*						
1919	700	20.6	14,399	146.1	21,032	30.05	245	160	+85
1920	701	18.7	13,142	128.3	16,863	24.06	399	336	+63
1921	680	20.9	14,207	81.2	11,540	16.97	485	113	+372
1922	764	19.1	14,564	88.5	12,889	16.87	172	286	−114
1923	739	18.9	13,965	93.3	13,029	17.63	92	322	−230
1924	*717*	*16.8*	*12,004*						
1924	745	17.9	13,357	102.6	13,708	18.40	191	546	−355
1925	747	18.7	13,994	88.8	12,423	16.63	79	88	−9
1926	694	18.3	12,676	88.2	11,183	16.11	66	86	−20
1927 [4]	832	19.4	16,182	83.5	13,518	16.25			

Bureau of Agricultural Economics. Production figures are estimates of the crop-reporting board; italic figures are census returns.

[4] Preliminary.

TABLE 112.—*Buckwheat: Acreage and production, by States, average 1921–1925, annual 1925–1927*

State	Acreage: Average 1921–1925	Acreage: 1925	Acreage: 1926	Acreage: 1927 [1]	Production: Average 1921–1925	Production: 1925	Production: 1926	Production: 1927 [1]
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
Maine	12	14	15	14	295	364	345	322
Vermont	3	3	3	2	73	66	69	52
New York	215	239	190	213	4,357	4,541	3,591	4,473
New Jersey	7	3	2	1	144	63	36	21
Pennsylvania	217	194	190	210	4,665	4,462	3,610	4,935
Ohio	25	24	22	28	500	473	385	588
Indiana	11	20	20	24	159	264	320	408
Illinois	5	5	5	6	80	70	65	97
Michigan	51	52	50	53	731	712	705	689
Wisconsin	29	29	23	23	422	464	315	382
Minnesota	54	61	66	126	735	854	1,122	1,764
Iowa	5	5	5	15	80	88	90	195
Missouri	1	1	1	1	13	14	15	20
North Dakota	[2] 7	6	9	11	[2] 68	72	135	160
South Dakota	10	11	9	18	123	132	126	279
Nebraska	1	1	1	1	16	14	11	15
Delaware	6	3	2	2	99	48	32	37
Maryland	8	7	8	8	170	168	162	176
Virginia	17	15	16	14	318	240	352	294
West Virginia	32	34	36	40	635	612	684	880
North Carolina	8	10	10	10	149	140	220	200
Kentucky	8	7	8	9	130	88	136	144
Tennessee	3	3	3	3	51	45	60	51
United States	735	747	694	832	14,017	13,994	12,676	16,182

Bureau of Agricultural Economics. Estimates of crop-reporting board.

[1] Preliminary.

[2] 2-year average.

TABLE 113.—*Buckwheat: Yield per acre and estimated price per bushel, December 1, by States, average 1914–1920, 1921–1925, annual 1923–1927*

State	Yield per acre							Estimated price per bushel						
	Av., 1914–1920	Av., 1921–1925	1923	1924	1925	1926	1927	Av., 1914–1920	Av., 1921–1925	1923	1924	1925	1926	1927
	Bush.	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
Maine	24.5	25.4	23.0	24.0	26.0	23.0	23.0	122	100	95	95	100	83	90
Vermont	22.4	21.6	18.0	22.0	22.0	23.0	26.0	126	95	100	105	90	85	96
New York	18.4	20.3	19.0	21.0	19.0	18.9	21.0	128	93	96	101	86	89	84
New Jersey	19.0	20.8	21.0	19.0	21.0	18.0	21.0	129	105	95	117	100	100	84
Pennsylvania	18.7	21.5	21.5	19.0	23.0	19.0	23.5	121	88	91	103	91	89	85
Ohio	20.3	20.1	20.0	16.0	19.7	17.5	21.0	119	94	94	103	86	95	86
Indiana	16.6	15.6	17.0	14.0	13.2	16.0	17.0	122	97	95	103	85	95	85
Illinois	17.8	14.9	15.0	14.0	14.0	13.0	16.2	140	103	101	120	100	92	85
Michigan	13.0	14.4	14.2	14.0	13.7	15.3	13.0	117	86	84	96	90	80	80
Wisconsin	15.0	14.5	14.0	13.0	16.0	15.0	16.6	126	87	89	103	79	87	82
Minnesota	16.5	13.8	13.0	12.0	14.0	17.0	14.0	114	83	90	102	75	75	70
Iowa	14.9	15.3	15.0	15.0	17.5	18.0	13.0	138	98	94	103	90	82	85
Missouri	14.8	13.4	13.0	13.0	14.0	15.0	20.0	140	118	118	105	90	85	90
North Dakota	------	[1] 10.0	------	8.0	12.0	15.0	14.5	-----	[1] 60	-----	60	60	80	64
South Dakota	------	12.6	14.0	14.8	12.0	14.0	15.5	-----	83	86	107	70	80	64
Nebraska	16.8	15.8	18.0	15.0	14.0	11.0	15.3	126	90	85	100	100	90	85
Delaware	19.0	16.8	18.0	16.8	16.0	16.0	18.5	120	88	91	102	92	90	95
Maryland	20.2	20.7	22.1	18.0	24.0	20.2	22.0	126	96	100	110	100	100	93
Virginia	20.2	18.6	19.3	17.3	16.0	22.0	21.0	124	95	95	106	110	95	93
West Virginia	20.3	19.6	20.0	17.0	18.0	19.0	22.0	131	95	96	112	100	100	97
North Carolina	18.7	18.2	22.0	18.0	14.0	22.0	20.0	111	104	108	119	110	100	100
Kentucky	------	16.1	13.0	14.0	12.5	17.0	16.0	-----	102	100	119	100	84	86
Tennessee	17.9	17.1	19.0	19.0	15.0	20.0	17.0	118	105	109	125	115	100	90
United States	18.3	19.1	18.9	17.9	18.7	18.3	19.4	124.1	90.9	93.3	102.6	88.8	88.2	83.5

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

[1] 2-year average.

TABLE 114.—*Buckwheat: Estimated price per bushel, received by producers, United States, 1909–1927*

Year beginning September	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	July 15	Aug. 15	Weighted av.
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
Average:													
1909–1913	73.0	71.1	70.2	70.3	70.8	70.9	71.4	72.6	74.4	77.3	78.3	76.1	72.0
1914–1920	131.2	126.2	124.1	124.8	125.1	125.3	126.5	129.8	138.5	148.9	150.1	142.8	129.6
1921–1925	102.4	93.2	90.8	91.7	91.7	92.0	94.1	93.6	97.8	100.2	102.1	103.6	94.3
1909	76.0	73.3	70.8	70.0	71.0	71.3	72.0	72.2	72.4	75.8	76.4	73.7	72.1
1910	72.0	68.6	66.0	66.0	65.1	64.2	64.7	65.6	68.0	71.2	74.2	75.0	67.5
1911	71.8	71.3	72.8	73.2	73.6	75.2	76.9	78.4	82.4	85.5	84.9	80.1	75.4
1912	73.2	67.6	65.8	66.4	68.1	68.2	67.6	69.8	71.1	71.8	72.6	71.2	68.3
1913	72.0	74.8	75.5	76.0	76.1	75.4	76.0	77.1	78.2	82.2	83.4	80.5	76.6
1914	79.2	78.4	77.2	77.2	80.8	84.6	85.4	85.0	85.8	89.5	90.6	85.3	81.1
1915	77.6	76.1	78.6	80.1	81.1	82.0	83.2	84.0	86.0	90.0	91.0	87.7	81.5
1916	88.4	96.6	107.8	115.0	115.9	119.7	126.6	139.4	167.2	196.4	199.2	176.8	126.5
1917	159.4	154.3	157.1	161.4	162.3	165.0	169.2	173.0	183.5	195.9	196.8	191.5	167.1
1918	185.2	176.5	169.8	164.7	160.5	153.2	149.0	148.4	156.4	163.2	163.4	162.8	164.7
1919	160.9	156.5	148.6	148.4	152.8	155.3	159.4	166.0	174.5	191.4	192.0	178.8	159.2
1920	167.8	145.2	129.6	126.8	122.0	117.5	112.8	112.6	116.0	115.7	117.5	117.0	126.8
1921	110.2	95.0	82.6	82.4	84.4	85.6	89.2	93.0	95.4	100.0	99.2	91.0	89.1
1922	85.2	82.2	84.4	89.0	88.5	88.6	92.6	95.0	98.4	102.3	101.4	99.4	89.9
1923	96.6	94.2	93.4	94.7	92.7	92.5	94.7	93.6	97.0	96.5	104.5	123.9	96.3
1924	118.8	107.1	106.8	104.6	107.0	112.2	112.4	104.1	113.3	112.3	115.7	110.0	108.6
1925	101.2	87.6	86.7	87.9	85.7	80.9	81.7	82.5	85.0	90.1	89.9	93.7	87.5
1926	90.4	86.5	83.6	83.5	83.6	84.6	86.0	85.1	88.1	98.8	101.0	98.1	87.0
1927	92.3	82.9	79.4	81.0	------	------	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Based on returns from special price reporters. Mean of prices reported on 1st of month and 1st of succeeding month, September, 1909–December, 1923.

TABLE 115.—*Sorghums:* [1] *Acreage, production, and November 15 price, United States, 1915–1927*

Year	Acreage for grain	Average yield per acre	Production	Price per bushel received by producers Nov. 15	Acreage for all purposes	Equivalent yield per acre	Equivalent production on total acreage
	1,000 acres	*Bushels*	*1,000 bush.*	*Cents*	*1,000 acres*	*Bushels*	*1,000 bush.*
1915	4,153	27.6	114,460	44.7			
1916	3,944	13.7	53,858	105.9			
1917	5,153	11.9	61,409	161.9			
1918	6,036	12.1	73,241	150.0			
1919	5,060	25.8	130,734	127.4			
1920	5,120	26.8	137,408	92.9			
1921	4,635	24.6	113,990	39.1			
1922	5,064	17.9	90,524	87.8			
1923	5,792	18.3	105,835	94.0			
1924	3,788	21.1	80,019	85.0	6,161	19.1	117,954
1925	4,096	18.3	74,813	[2] 75.3	6,648	16.0	106,390
1926	4,387	22.9	100,256	[2] 53.9	6,690	20.6	137,515
1927 [3]	4,431	22.8	100,956	[2] 61.6	6,733	20.4	137,608

Bureau of Agricultural Economics. Estimates of crop-reporting board.

[1] Kafirs, milo maize, feterita, etc. [2] Dec. 1 price. [3] Preliminary.

TABLE 116.—*Sorghums:* [1] *Acreage, production, and December 1 price, by States, 1924–1927*

State	Acreage 1924	Acreage 1925	Acreage 1926	Acreage 1927 [2]	Average yield per acre 1924	1925	1926	1927
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Bushels*	*Bushels*	*Bushels*	*Bushels*
Missouri	45	40	94	113	15.0	15.0	18.0	24.0
Nebraska	25	20	22	30	18.0	15.0	10.6	23.5
Kansas	1,324	1,456	1,345	1,547	18.8	16.0	15.0	21.0
Oklahoma	1,599	1,745	1,817	1,744	18.0	12.5	19.0	20.0
Texas	2,474	2,798	2,854	2,654	21.0	18.0	25.0	21.0
Colorado	290	296	227	284	8.0	11.0	5.0	10.0
New Mexico	280	165	195	171	20.0	18.0	21.0	14.0
Arizona	40	40	40	60	18.0	20.0	31.0	30.0
California	84	88	96	130	30.5	34.0	32.0	31.2
United States	6,161	6,648	6,690	6,733	19.1	16.0	20.6	20.4

State	Production 1924	Production 1925	Production 1926	Production 1927 [2]	Price per bushel received by producers Dec. 1: 1924 [3]	1925	1926	1927
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*Cents*	*Cents*	*Cents*	*Cents*
Missouri	675	600	1,692	2,712	115	100	80	75
Nebraska	450	300	233	705	91	75	80	80
Kansas	24,891	23,296	20,175	32,487	80	71	60	60
Oklahoma	28,782	21,812	34,523	34,880	77	75	45	50
Texas	51,954	50,364	71,350	55,734	87	76	55	65
Colorado	2,320	3,256	1,135	2,840	90	71	60	65
New Mexico	5,600	2,970	4,095	2,394	100	65	40	80
Arizona	720	800	1,240	1,800	130	66	60	75
California	2,562	2,992	3,072	4,056	135	107	84	97
United States	117,954	106,390	137,515	137,608	85.0	75.3	53.9	61.6

Bureau of Agricultural Economics. Estimates of crop-reporting board.

[1] Kafirs, milo maize, feterita, etc. [2] Preliminary. [3] Nov. 15 price.

TABLE 117.—*Kafir: Receipts at Kansas City, by months, 1909–1927*

Year beginning November	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Total
	1,000 bush.	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*
Average:													
1909–1913	177	272	269	229	115	92	87	87	42	22	26	47	1,464
1914–1920	147	480	628	509	475	371	318	302	231	134	83	83	3,762
1921–1925	310	585	491	455	343	264	228	287	170	100	64	72	3,371
1909	106	50	125	150	161	45	32	20	12	8	5	4	718
1910	107	287	224	179	86	52	71	56	30	42	19	62	1,215
1911	202	323	255	410	191	198	186	121	75	46	62	103	2,172
1912	446	645	610	333	111	151	129	223	90	11	33	26	2,808
1913	22	53	133	72	25	15	16	15	3	1	9	42	406
1914	311	719	661	618	189	486	252	186	206	204	112	130	4,074
1915	367	1,116	1,200	936	866	682	625	256	202	104	85	24	6,463
1916	79	199	192	274	72	45	38	9	8	8	6	6	936
1917	88	278	464	385	506	322	98	107	40	29	9	7	2,333
1918	51	163	153	168	384	329	375	95	160	65	87	80	2,110
1919	22	233	745	721	741	449	540	817	768	235	160	123	5,554
1920	112	654	980	463	569	287	301	644	234	293	120	209	4,866
1921	263	350	471	537	392	312	199	212	150	84	35	120	3,125
1922	168	444	420	233	169	139	76	50	69	35	19	18	1,840
1923	195	350	465	579	398	340	274	262	250	106	63	103	3,385
1924	647	1,152	683	636	497	320	301	440	221	183	68	24	5,172
1925	279	629	416	290	261	211	290	469	162	94	136	97	3,334
1926	397	493	626	442	293	216	192	241	249	285	79	112	3,625
1927	410	905	------	------	------	------	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Compiled from annual statistical reports of Kansas City Board of Trade, 1909–1926.

TABLE 118.—*Grain sorghums: Classification of cars graded by licensed inspectors, all inspection points*

TOTAL OF ALL CLASSES AND SUBCLASSES UNDER EACH GRADE, BY CARS, ANNUAL, 1925–26

Year and class	Receipts						Shipments					
	No. 1	No. 2	No. 3	No. 4	Sample	Total	No. 1	No. 2	No. 3	No. 4	Sample	Total
Beginning July 1—	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
1925	312	4,158	5,796	1,639	495	12,400	101	1,802	2,017	297	48	4,265
1926	878	7,180	6,674	1,792	691	17,215	128	2,980	2,380	256	80	5,824

TOTAL INSPECTIONS, BY GRADE AND CLASS, JULY 1, 1926, TO JUNE 30, 1927

Year and class	Receipts No. 1	Receipts No. 2	Receipts No. 3	Receipts No. 4	Receipts Sample	Receipts Total	Shipments No. 1	Shipments No. 2	Shipments No. 3	Shipments No. 4	Shipments Sample	Shipments Total
Kafir	317	3,228	1,917	828	286	6,576	87	1,171	663	97	11	2,029
Milo	435	3,115	3,854	700	285	8,389	38	1,181	1,138	80	59	2,406
Durra	90	28	5	4	2	129	1	0	0	0	0	1
Feterita	0	5	2	4	0	11	0	0	0	0	0	0
Darso	1	12	18	30	4	65	1	1	2	8	0	12
Freed Sorgo	2	0	1	1	0	4	0	0	0	0	0	0
Brown Kaoliang	0	0	0	2	0	2	0	0	0	0	0	0
Schrock Kafir	0	0	3	3	0	6	0	0	0	0	0	0
Shallu	0	0	0	0	0	0	0	0	0	0	0	0
Mixed	33	792	874	220	114	2,033	1	627	577	71	10	1,286

TOTAL OF ALL CLASSES AND SUBCLASSES UNDER EACH GRADE, BY PERCENTAGES, ANNUAL, 1925–26

Year and class	Receipts No. 1	Receipts No. 2	Receipts No. 3	Receipts No. 4	Receipts Sample	Receipts Total	Shipments No. 1	Shipments No. 2	Shipments No. 3	Shipments No. 4	Shipments Sample	Shipments Total
Beginning July 1—	*P.ct.*	*P.ct.*	*P.ct.*	*P.ct.*	*P.ct.*	*P.ct.*	*P.ct.*	*P.ct.*	*P.ct.*	*P.ct.*	*P.ct.*	*P.ct.*
1925	2.5	33.5	46.8	13.2	4.0	100	2.4	42.2	47.3	7.0	1.1	100
1926	5.1	41.7	38.8	10.4	4.0	100	2.2	51.2	40.9	4.4	1.3	100

TABLE 118.—*Grain sorghums: Classification of cars graded by licensed inspectors, all inspection points*—Continued

TOTAL INSPECTIONS, BY GRADE AND CLASS, JULY 1, 1926, TO JUNE 30, 1927

Year and class	Receipts						Shipments					
	No. 1	No. 2	No. 3	No. 4	Sample	Total	No. 1	No. 2	No. 3	No. 4	Sample	Total
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
Kafir	4.8	49.1	29.2	12.6	4.3	100	4.3	57.7	32.7	4.8	0.5	100
Milo	5.2	37.1	45.9	8.4	3.4	100	1.5	47.3	45.6	3.2	2.4	100
Durra	69.8	21.7	3.9	3.1	1.5	100	100	0	0	0	0	100
Feterita	0	45.4	18.2	36.4	0	100	0	0	0	0	0	0
Darso	1.5	18.5	27.7	46.2	6.1	100	8.3	8.3	16.7	66.7	0	100
Freed Sorgo	50.0	0	25.0	25.0	0	100	0	0	0	0	0	0
Brown Kaoliang	0	0	0	100.0	0	100	0	0	0	0	0	0
Schrock Kafir	0	0	50.0	50.0	0	100	0	0	0	0	0	0
Shallu	0	0	0	0	0	0	0	0	0	0	0	0
Mixed	1.6	39.0	43.0	10.8	5.6	100	.1	48.7	44.9	5.5	.8	100

Grain Division.

TABLE 119.—*Kafir, No. 2 White: Weighted average price per bushel of reported cash sales, Kansas City, 1909–1927*

Year beginning November	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Weighted av.[1]
Average:	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1909–1913	66	64	70	------	69	------	77	------	------	------	------	------	------
1914–1920	118	114	113	114	115	117	124	123	132	142	130	120	122
1921–1925	------	77	------	81	79	80	80	86	93	------	------	------	------
1909	67	73	86	80	77	74	82	84	86	101	100	67	81
1910	63	54	54	52	53	53	59	69	80	75	71	68	63
1911	59	55	67	([2])	72	80	81	70	91	94	76	63	73
1912	55	48	48	46	45	46	49	62	61	79	86	85	59
1913	88	91	96	96	99	([2])	112	([2])	([2])	([2])	([2])	([2])	------
1914	58	64	74	77	72	66	64	67	65	61	58	59	66
1915	51	55	55	54	52	59	59	62	68	88	96	103	67
1916	131	118	136	139	149	178	212	188	224	251	243	207	181
1917	190	182	186	207	215	189	164	143	170	190	190	183	184
1918	166	146	146	151	143	150	166	192	197	202	135	131	160
1919	150	164	139	122	129	133	148	141	132	136	125	101	135
1920	78	66	55	51	48	45	58	63	68	63	63	57	59
1921	48	50	50	72	74	67	72	77	93	96	111	102	76
1922	100	91	89	90	93	96	99	94	84	83	([2])	([2])	------
1923	([2])	71	([2])	68	67	73	62	85	94	([2])	113	89	------
1924	88	98	109	103	93	92	97	105	113	116	107	100	101
1925	82	77	77	72	68	70	69	70	79	76	74	71	73
1926	64	64	63	63	65	69	79	102	110	97	([2])	70	------
1927	69	71	------	------	------	------	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Compiled from Kansas City Grain Market Review, formerly Daily Price Current. Quoted per 100 pounds; converted to bushels of 56 pounds.

[1] Average of daily prices weighted by car-lot sales. [2] No quotations.

FRUITS AND VEGETABLES

TABLE 120.—*Apples: Number of trees by States, census years, 1910–1925*

State	1910		1920		1925	
	Trees of bearing age	Trees not of bearing age	Trees of bearing age	Trees not of bearing age	Trees of bearing age	Trees not of bearing age
	Number	*Number*	*Number*	*Number*	*Number*	*Number*
Maine	3. 476, 616	1, 045, 123	2, 833, 304	512. 217	2, 441, 937	435, 091
New Hampshire	1, 240, 885	207. 289	721, 130	227, 933	620, 412	236. 602
Vermont	1, 183, 529	219, 833	712, 594	254, 029	559. 046	175, 936
Massachusetts	1, 367. 379	355, 868	1, 218, 870	791, 771	1, 402, 223	756, 897
Rhode Island	152, 009	54 560	173 110	71, 375	165, 856	57, 481
Connecticut	798, 734	211, 839	692, 569	266, 405	701, 160	295, 939
New York	11. 248, 203	2, 828. 515	9, 636. 698	2, 932, 281	9, 468, 661	2, 422. 156
New Jersey	1. 053, 626	519, 749	1, 149, 776	811, 256	1, 421, 736	827, 078
Pennsylvania	8. 000. 456	2, 501, 185	6. 988, 594	2, 628, 053	6, 726, 473	2. 078, 469
Ohio	8 504, 886	2, 438, 246	5, 970, 410	2, 047, 687	5. 354, 089	2, 066, 338
Indiana	5. 764, 821	1, 961. 074	3, 427, 816	929, 160	2, 783, 391	1, 046, 302
Illinois	9, 900, 627	2, 548, 301	5, 113, 063	1, 825, 886	4, 129, 330	2, 636, 634
Michigan	7, 534, 343	2, 253, 072	5. 615, 905	2, 050, 229	5, 544, 840	1, 871, 434
Wisconsin	2, 430, 232	1. 408, 726	2, 321, 860	825, 258	2, 204, 326	702, 456
Minnesota	1, 380, 396	1, 571, 816	1, 596, 264	637, 187	1, 370, 059	354, 107
Iowa	5, 847, 034	1, 914, 325	2, 996, 469	767, 351	2, 254, 715	744, 429
Missouri	14, 359, 673	3, 624, 833	5, 162, 859	1, 585, 823	3, 659, 886	1, 772, 077
North Dakota	15, 941	70, 023	26, 157	19, 694	23 197	14, 533
South Dakota	274, 862	460. 547	255, 637	136, 082	213. 103	79, 560
Nebraska	2, 937, 178	967, 133	961, 313	401, 788	697, 957	330, 460
Kansas	6, 929, 673	1, 116, 316	1, 508, 042	618 142	1, 122, 371	684, 563
Delaware	429, 753	263, 813	816, 109	308, 487	824, 348	242, 976
Maryland	1, 288, 482	660, 685	1, 651, 936	766, 264	1, 696, 549	488, 554
District of Columbia	1, 654	29	1, 036	1, 178	1, 496	98
Virginia	7, 004. 548	3, 435. 591	7, 385, 277	2, 857. 007	8, 010 777	2, 272, 786
West Virginia	4, 570, 948	2, 772. 025	5, 554, 731	1, 735, 126	5, 480, 350	1, 361, 390
North Carolina	4, 910, 171	1, 835, 337	3. 474, 821	1, 394, 588	3, 693, 388	1. 162, 694
South Carolina	581, 767	269, 044	377. 557	181, 101	369, 530	258, 913
Georgia	1, 878, 209	822, 327	1. 515, 505	806, 731	1, 404, 250	603, 030
Florida	8, 180	5, 968	493	1. 490	2, 592	5. 109
Kentucky	5, 538, 267	2, 106, 297	3. 742, 936	1, 427, 408	3, 278, 263	1, 488, 544
Tennessee	4, 838, 922	2, 117, 246	3, 181, 659	1, 032, 490	2, 887, 806	1, 175, 214
Alabama	1, 468, 436	737. 689	1, 044, 397	422, 646	798. 070	426. 342
Mississippi	427, 652	425. 323	269, 862	210, 086	189, 336	150, 358
Arkansas	7, 650, 103	3, 040, 089	4. 074, 870	877, 376	2, 695, 820	1, 681, 331
Louisiana	93, 304	96, 544	47, 037	44, 175	31, 217	37, 937
Oklahoma	2, 955, 810	2, 060. 384	1, 417, 911	428. 502	919, 490	434, 450
Texas	1, 138, 852	1, 127, 573	468, 027	236, 485	276, 703	151, 026
Montana	696, 753	1, 308, 066	1, 059, 198	69, 328	710, 960	31, 796
Idaho	1, 005, 668	1, 539, 896	2, 380, 523	144. 088	1, 760, 648	127, 894
Wyoming	27, 773	84, 024	50, 302	34, 197	40, 554	10, 018
Colorado	1, 688, 425	1. 972, 914	1, 777, 737	183, 315	1, 389, 712	84, 162
New Mexico	512, 528	914, 254	687, 799	167, 097	596, 603	80, 291
Arizona	62, 027	53, 884	70, 273	35, 977	71, 760	26, 401
Utah	517, 039	789, 260	726, 471	80, 304	558. 106	104, 620
Nevada	74, 454	16, 868	42, 612	9, 265	48, 532	14, 501
Washington	3, 009, 337	4, 862. 702	7, 964, 167	755, 898	6, 781, 852	1, 049, 949
Oregon	2, 029, 913	2, 240, 636	3, 315, 093	500, 322	2, 773, 293	257. 819
California	2, 482, 762	1, 054, 107	3, 128, 386	1. 143, 947	3, 540, 407	886, 453
United States	151, 322, 840	65. 791, 848	115, 309, 165	36, 195, 085	103, 697, 180	34, 209, 348

Bureau of Agricultural Economics. Compiled from reports of the Bureau of the Census.

TABLE 121.—*Apples: Total production, foreign trade in the United States, and average price per barrel for Baldwin apples at Boston, 1889–1927*

Year	Production	Domestic exports year beginning July 1: Green or ripe	Domestic exports year beginning July 1: Dried	Imports,[1] year beginning July 1, fresh and dried in terms of fresh	Average price of Baldwins at Boston, season November to April [2]
	1,000 bushels	*1,000 barrels*	*1,000 pounds*	*1,000 barrels*	*Dollars*
1889	*143,106*	454	20,861	([3])	3.24
1890	80,142	135	6,973	[3] 16	4.40
1891	198,907	939	26,042	7	1.78
1892	120,536	408	7,967	287	2.31
1893	114,773	79	2,847	93	4.21
1894	134,648	819	7,086	126	2.40
1895	219,600	360	26,692	51	3.10
1896	232,600	1,504	30,775	66	1.03
1897	163,728	605	31,031	8	3.23
1898	118,061	380	19,306	79	3.18
1899	*175,398*	527	34,964	26	2.94
1900	205,930	884	28,309	19	2.28
1901	135,500	460	15,664	14	4.07
1902	212,330	1,656	39,646	5	1.93
1903	195,080	2,018	48,302	13	2.40
1904	233,630	1,500	39,273	6	1.96
1905	136,220	1,209	27,853	33	3.59
1906	216,720	1,539	45,698	5	2.44
1907	119,560	1,050	24,238	87	2.35
1908	148,940	896	33,475	15	3.99
1909	*145,412*	922	25,077	32	2.99
1910	141,640	1,721	21,804	13	3.68
1911	214,020	1,456	53,665	9	2.56
1912	235,220	2,150	41,575	8	2.28
1913	145,410	1,507	33,566	20	3.95
1914	253,200	2,352	42,589	22	2.08
1915	230,011	1,466	16,219	5	2.36
1916	193,905	1,740	10,358	7	3.44
1917	166,749	635	2,603	15	4.40
1918	169,625	1,576	18,909	16	5.94
1919	*136,561*	-------	-------	-------	-------
1919	142,086	1,051	11,819	283	6.71
1920	223,677	2,665	18,053	47	4.02
1921	99,002	1,094	12,431	451	6.69
1922	202,702	1,756	12,817	63	4.84
1923	202,842	4,098	30,410	44	4.02
1924	*152,967*	3,201	-------	-------	-------
1924	171,725	-------	19,225	35	4.78
1925	172,389	3,672	24,833	25	3.92
1926	246,524	6,704	32,670	28	[4] 3.22
1927, preliminary	123,455	-------	-------	-------	-------

Bureau of Agricultural Economics. Production figures are estimates of the crop-reporting board; italic figures are census returns.

[1] Fresh apples, imports for consumption 1890–1922; general imports 1922–1926. Dried apples, imports for consumption, 1890–1927. Dried apples converted to terms of fresh on the basis that dried apples equal 20 per cent of fresh and 144 pounds of fresh apples equal 1 barrel.
[2] Figures 1889–1922 from Boston Chamber of Commerce reports. Average of weekly quotations of price actually paid by wholesale dealers on days quoted. Figures, 1923–1926 from Bureau of Agricultural Economics. Average of l. c. l. price for United States No. 1, one day weekly.
[3] No imports reported prior to Oct. 6, 1890. Figure for 1890 represents imports Oct. 6, 1890, to June 30, 1891.
[4] Average does not include December.

TABLE 122.—*Apples: Production, by States, 1922–1927*

State	Total: 1922	Total: 1923	Total: 1924	Total: 1925	Total: 1926	Total: 1927 [2]	Commercial [1]: 1922	Commercial [1]: 1923	Commercial [1]: 1924	Commercial [1]: 1925	Commercial [1]: 1926	Commercial [1]: 1927 [2]
	1,000 bus.	*1,000 bus.*	*1,000 bus.*	*1,000 bus.*	*1,000 bus.*	*1,000 bus.*	*1,000 bus.*	*1,000 bus.*	*1,000 bus.*	*1,000 bus.*	*1,000 bus.*	*1,000 bus.*
Maine	1,250	2,500	3,241	3,305	2,260	2,236	696	1,440	1,980	1,935	1,350	1,365
New Hampshire	775	935	1,462	1,230	1,240	1,100	357	450	876	711	762	690
Vermont	960	521	895	935	800	990	384	267	480	510	465	570
Massachusetts	3,010	3,300	3,360	3,160	4,100	2,520	1,383	1,800	2,025	1,965	2,640	1,590
Rhode Island	200	450	324	299	391	242	60	240	192	171	237	150
Connecticut	1,300	1,600	1,480	1,375	1,900	1,045	324	600	855	900	1,050	540
New York	36,000	25,000	22,000	32,500	40,375	13,600	18,000	12,600	11,214	18,750	18,000	8,163
New Jersey	2,610	2,203	2,800	2,660	4,310	2,697	1,656	1,410	1,836	1,821	2,832	1,833
Pennsylvania	11,400	10,855	7,800	7,300	17,000	6,300	3,648	3,798	2,340	3,033	5,388	2,550
Ohio	7,298	12,395	6,350	6,300	11,900	5,600	1,824	3,099	2,082	2,034	3,018	1,623
Indiana	4,148	5,035	1,800	2,430	4,100	1,249	831	900	435	600	864	276
Illinois	9,720	7,500	6,400	7,300	9,000	4,450	4,350	4,200	3,300	3,645	3,870	2,412
Michigan	11,850	13,159	6,000	9,000	9,045	4,288	5,097	6,354	3,000	5,100	4,467	2,271
Wisconsin	2,024	2,340	1,378	2,106	2,158	1,200	303	408	294	471	465	270
Minnesota	1,020	1,520	850	820	1,263	854	123	183	114	114	171	111
Iowa	4,410	4,350	2,800	2,400	3,652	1,720	660	870	450	240	402	207
Missouri	9,400	7,072	4,300	4,100	5,015	2,104	3,750	2,550	1,764	1,938	1,857	870
South Dakota	263	212	150	62	169	200	12	9	-------	-------	-------	-------

[1] Included in "Total crop." By commercial crop is meant that portion of the total crop which is sold for consumption as fresh fruit.
[2] Preliminary.

TABLE 122.—*Apples: Production, by States, 1922–1927*—Continued

State	Total						Commercial					
	1922	1923	1924	1925	1926	1927	1922	1923	1924	1925	1926	1927
	1,000 bus.	*1,000 bus.*	*1,000 bus.*	*1,000 bus.*	*1,000 bus.*	*1,000 bus.*	*1,000 bus.*	*1,000 bus.*	*1,000 bus.*	*1,000 bus.*	*1,000 bus.*	*1,000 bus.*
Nebraska	1,620	880	1,000	450	700	850	390	309	360	195	228	330
Kansas	3,280	2,166	2,200	1,600	1,428	1,925	1,638	1,200	1,032	855	939	1,347
Delaware	1,411	1,200	1,250	1,340	2,376	1,150	1,140	1,020	930	1,140	1,980	900
Maryland	1,500	2,300	1,850	1,900	3,500	1,700	840	1,380	942	972	1,800	1,200
Virginia	8,900	10,000	14,500	7,844	19,902	6,000	4,200	5,850	7,560	4,320	11,100	4,500
West Virginia	5,625	8,320	7,000	4,185	10,875	5,200	2,643	4,200	2,400	2,247	5,100	4,200
North Carolina	6,000	2,700	6,350	3,192	5,986	1,825	708	309	921	480	1,035	273
South Carolina	383	274	600	386	647	363	-----	-----	-----	-----	-----	-----
Georgia	1,135	864	1,500	741	1,827	595	285	180	360	180	456	240
Kentucky	5,070	2,625	5,700	2,625	6,408	720	507	210	486	210	501	75
Tennessee	4,250	1,311	4,800	1,984	5,360	1,152	285	90	318	123	375	81
Alabama	1,098	731	1,190	595	1,328	328	54	36	-----	-----	-----	-----
Mississippi	216	120	270	221	324	152	-----	-----	-----	-----	-----	-----
Arkansas	2,400	3,025	4,100	4,315	3,450	1,015	1,560	1,968	2,100	1,950	1,500	480
Louisiana	37	31	30	28	35	18	-----	-----	-----	-----	-----	-----
Oklahoma	1,140	1,240	1,170	644	770	493	114	126	162	87	93	60
Texas	264	270	330	264	380	168	45	45	-----	-----	-----	-----
Montana	610	990	290	80	325	277	345	390	210	42	282	195
Idaho	3,900	5,600	2,178	6,029	4,200	6,000	3,450	4,800	1,800	5,250	2,775	5,400
Wyoming	40	35	50	25	47	40	-----	-----	-----	-----	-----	-----
Colorado	4,250	3,010	3,024	3,200	3,444	2,592	3,102	2,409	2,418	2,850	2,907	2,253
New Mexico	750	1,400	840	1,021	1,147	456	450	945	567	780	600	360
Arizona	77	128	70	98	112	62	27	42	21	30	33	30
Utah	1,085	1,119	600	1,300	817	660	594	780	360	900	480	402
Nevada	35	56	40	74	42	18	-----	-----	-----	-----	-----	-----
Washington	25,775	33,000	22,000	29,550	34,030	25,343	22,023	28,800	18,825	26,010	25,950	22,302
Oregon	6,300	8,000	6,500	5,400	8,036	4,500	3,780	5,250	4,500	3,888	5,250	2,925
California	7,850	10,500	8,903	6,016	10,350	7,458	4,197	6,300	4,470	3,291	6,144	4,656
United States	202,702	202,842	171,725	172,389	246,524	123,455	95,835	107,808	84,039	99,738	117,357	77,700

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

TABLE 123.—*Apples: Car-lot shipments, by State of origin, 1923–1927*

State and year	Crop movement season [1]													
	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total
Eastern:														
New England—	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
1923	-----	-----	2	87	692	598	67	69	27	25	18	4	-----	1,589
1924	-----	-----	-----	105	1,297	1,814	349	123	91	51	17	4	-----	3,851
1925	-----	-----	4	208	1,281	745	93	66	45	37	10	4	1	2,494
1926 [2]	-----	-----	7	100	761	621	112	88	80	53	9	6	-----	1,837
1927 [2]	-----	-----	3	179	888	591	44	-----	-----	-----	-----	-----	-----	-----
New York—														
1923	-----	4	334	1,715	4,207	3,317	1,201	1,697	2,005	2,839	1,711	1,015	299	20,434
1924	-----	7	591	1,491	3,986	2,994	1,186	1,576	1,586	1,536	1,001	577	117	16,631
1925	-----	36	693	2,886	7,426	5,102	1,889	2,306	2,029	3,044	1,833	1,026	329	29,499
1926 [2]	-----	3	256	1,701	4,456	3,991	1,724	2,429	2,631	1,896	1,434	903	255	21,679
1927 [2]	-----	14	197	975	2,234	1,616	820	-----	-----	-----	-----	-----	-----	-----
Pennsylvania—														
1923	-----	20	30	382	1,611	933	292	303	288	143	19	9	3	4,033
1924	-----	4	5	67	630	337	163	240	152	74	21	13	-----	1,706
1925	-----	17	52	333	982	342	223	216	176	102	31	12	-----	2,486
1926 [2]	-----	13	27	320	1,670	1,068	357	525	601	328	63	13	-----	4,985
1927 [2]	-----	13	56	141	1,259	592	234	-----	-----	-----	-----	-----	-----	-----
Illinois—														
1923	22	481	203	1,603	3,519	607	78	75	70	45	68	39	22	6,832
1924	37	484	305	1,155	2,949	502	79	69	63	57	42	105	20	5,867
1925	257	563	443	1,955	2,630	460	44	41	37	47	66	17	1	6,561
1926 [2]	39	684	242	1,168	2,804	716	103	79	96	111	87	20	-----	6,149
1927 [2]	162	248	262	865	565	20	26	-----	-----	-----	-----	-----	-----	-----
Michigan—														
1923	-----	39	5,220	1,406	3,851	1,970	240	80	142	193	90	28	7	9,266
1924	-----	2	388	657	1,443	727	60	35	37	37	40	16	1	3,443
1925	-----	44	734	1,010	2,700	1,120	107	42	61	40	33	22	5	6,008
1926 [2]	-----	4	403	533	1,757	1,222	101	46	91	78	54	31	8	4,328
1927 [2]	-----	1	177	256	974	291	23	-----	-----	-----	-----	-----	-----	-----

[1] Crop movement season extends from June 1 of one year through June of the following year.
[2] Preliminary.

TABLE 123.—*Apples: Car-lot shipments, by State of origin, 1923–1927*—Contd.

State and year	Crop movement season													
	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total
Eastern—Contd.														
Missouri—	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
1923	1	17	33	785	2,002	653	110	61	62	62	61	102	71	4,050
1924	2	20	44	606	1,590	257	105	92	76	57	37	48	5	2,939
1925	15	23	114	745	1,488	315	56	50	61	90	53	31	6	3,056
1926 [2]	7	21	19	406	1,006	175	70	64	111	66	42	20	8	2,015
1927 [2]	-----	7	28	305	245	9	6	-----	-----	-----	-----	-----	-----	-----
Delaware—														
1923	16	943	66	286	239	14	3	7	11	3	1	1	-----	1,590
1924	2	644	231	167	257	40	13	21	8	1	-----	-----	-----	1,384
1925	33	1,140	70	259	302	18	9	23	32	9	1	-----	-----	1,896
1926 [2]	1	913	180	306	479	86	16	30	47	41	-----	-----	-----	2,099
1927 [2]	3	694	209	179	234	5	8	-----	-----	-----	-----	-----	-----	-----
Maryland—														
1923	20	150	94	304	876	450	100	111	35	35	5	1	-----	2,181
1924	-----	134	55	203	561	151	51	52	29	3	-----	-----	-----	1,239
1925	8	127	83	222	530	233	40	26	33	19	7	5	-----	1,333
1926 [2]	4	216	83	375	947	504	150	79	92	30	11	-----	-----	2,491
1927 [2]	8	136	93	248	667	416	74	-----	-----	-----	-----	-----	-----	-----
Virginia—														
1923	-----	50	129	1,963	3,892	1,482	773	712	304	200	115	101	109	9,830
1924	-----	59	171	2,336	5,855	2,503	580	552	306	341	164	137	76	13,080
1925	-----	46	297	2,676	2,418	696	435	350	215	226	87	46	10	7,502
1926 [2]	-----	65	302	4,155	6,573	3,283	906	1,316	1,026	573	320	175	189	18,973
1927 [2]	-----	100	520	1,762	2,586	1,072	526	-----	-----	-----	-----	-----	-----	-----
West Virginia—														
1923	-----	78	118	1,162	3,446	1,585	340	271	108	114	39	35	36	7,332
1924	-----	48	91	516	1,762	721	220	127	106	69	58	34	10	3,762
1925	-----	88	136	1,015	1,729	593	153	91	64	15	11	18	14	3,927
1926 [2]	-----	65	129	1,420	2,827	1,608	414	229	384	225	53	43	5	7,393
1927 [2]	-----	91	228	1,205	2,918	1,510	351	-----	-----	-----	-----	-----	-----	-----
Arkansas—														
1923	11	13	190	727	1,116	506	29	29	25	36	42	38	1	2,763
1924	11	39	113	934	1,593	447	100	66	70	40	28	4	-----	3,451
1925	8	89	597	521	1,353	294	76	35	84	86	38	10	-----	3,191
1926 [2]	17	38	129	343	812	306	70	57	31	25	14	-----	-----	1,842
1927 [2]	13	28	234	176	76	4	12	-----	-----	-----	-----	-----	-----	-----
Other eastern—														
1923	22	190	320	1,018	2,552	803	162	57	69	36	27	18	5	5,279
1924	123	160	171	777	2,587	702	170	78	73	57	15	4	1	4,918
1925	58	263	339	1,178	1,961	406	86	67	80	90	73	40	13	4,654
1926 [2]	97	249	268	973	2,158	750	255	168	232	248	192	84	11	5,685
1927 [2]	57	170	484	955	1,883	264	69	-----	-----	-----	-----	-----	-----	-----
Total eastern—														
1923	92	1,985	2,739	11,438	28,093	12,918	3,425	3,472	3,146	3,731	2,196	1,391	553	75,179
1924	175	1,601	2,165	9,017	24,490	11,195	3,082	3,031	2,507	2,323	1,423	942	230	62,271
1925	379	2,436	3,562	13,008	24,890	10,324	3,211	3,319	3,817	3,805	2,243	1,234	379	72,607
1926 [2]	105	2,271	2,036	11,800	26,250	14,330	4,368	5,110	5,422	3,674	2,279	1,295	476	79,476
1927 [2]	243	1,502	2,491	7,246	14,529	6,390	2,202	-----	-----	-----	-----	-----	-----	-----
Western:														
Idaho—														
1923	-----	1	5	266	2,595	1,895	660	648	513	237	56	17	12	6,935
1924	-----	1	-----	397	888	606	193	77	37	13	3	7	1	2,223
1925	-----	1	10	882	2,967	1,543	844	416	393	217	143	87	2	7,485
1926 [2]	-----	2	3	1,182	1,502	388	256	196	102	31	9	6	-----	3,677
1927 [2]	-----	1	8	577	4,021	1,787	611	-----	-----	-----	-----	-----	-----	-----
Colorado—														
1923	-----	-----	4	274	1,150	579	289	118	197	95	12	-----	-----	2,718
1924	-----	-----	3	239	1,205	580	223	65	57	27	5	-----	-----	2,404
1925	-----	1	5	429	1,374	734	326	118	100	72	29	5	-----	3,193
1926 [2]	-----	1	1	211	1,405	737	274	124	74	37	9	4	-----	2,877
1927 [2]	-----	-----	11	114	1,206	585	137	-----	-----	-----	-----	-----	-----	-----
Washington—														
1923	-----	65	204	2,486	13,111	7,871	2,708	3,410	3,813	1,962	1,074	818	111	37,633
1924	8	26	192	3,186	9,056	5,527	2,066	1,669	1,085	730	737	606	268	25,156
1925	-----	108	422	5,179	11,602	5,916	2,503	2,029	2,263	1,858	1,519	1,114	533	35,046
1926 [2]	-----	62	555	5,686	11,763	5,865	2,089	2,122	2,083	1,381	1,144	978	401	34,729
1927 [2]	-----	15	93	2,409	9,445	6,322	2,510	-----	-----	-----	-----	-----	-----	-----
Oregon—														
1923	-----	19	27	371	2,241	2,012	635	482	394	186	59	1	1	6,428
1924	-----	-----	40	497	2,329	1,459	613	323	129	82	41	1	1	5,515
1925	1	6	34	474	2,166	992	344	213	170	159	103	40	-----	4,702
1926 [2]	5	10	105	769	2,751	1,498	584	307	248	80	53	12	-----	6,422
1927 [2]	-----	1	11	174	1,299	849	253	-----	-----	-----	-----	-----	-----	-----
California—														
1923	61	1,290	984	1,277	1,431	771	219	122	77	123	55	65	30	6,505
1924	22	734	645	943	1,185	695	186	120	111	97	85	59	9	4,891
1925	53	341	155	498	691	227	90	99	100	109	71	63	31	2,531
1926 [2]	90	1,494	594	961	991	343	149	79	73	138	102	59	11	5,084
1927 [2]	10	289	841	618	914	531	149	-----	-----	-----	-----	-----	-----	-----

[2] Preliminary.

TABLE 123.—*Apples: Car-lot shipments, by State of origin, 1923–1927*—Contd.

State and year	Crop movement season													
	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Total
Western—Contd.														
Other western—	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
1923	-----	-----	159	577	1, 255	525	125	46	43	36	17	3	-----	2, 786
1924	-----	-----	81	362	713	169	30	9	8	5	1	-----	-----	1, 334
1925	-----	2	142	483	1, 251	360	54	29	12	8	3	1	-----	2, 345
1926 [2]	-----	-----	94	413	776	188	55	31	18	6	-----	1	-----	1, 582
1927 [2]	-----	-----	86	230	521	148	19	------	------	------	-----	-----	-----	-------
Total western—														
1923	61	1, 375	1, 383	5, 251	21, 783	13, 653	4, 636	4, 826	5, 067	2, 639	1, 273	904	151	63, 005
1924	30	761	961	5, 624	15, 376	9, 036	3, 317	2, 263	1, 427	954	872	673	279	41, 573
1925	54	459	768	7, 945	20, 051	9, 772	4, 161	2, 934	3, 038	2, 423	1, 871	1, 260	566	55, 302
1926 [2]	95	1, 569	1, 352	9, 222	19, 188	9, 019	4, 007	2, 859	2, 598	1, 673	1, 317	1, 060	412	54, 371
1927 [2]	10	306	1, 050	4, 122	17, 406	10, 222	3, 679	------	------	------	-----	-----	-----	-------
Total—														
1923	153	3, 360	4, 122	16, 689	49, 876	26, 571	8, 061	8, 298	8, 213	6, 370	3, 469	2, 295	707	138, 184
1924	205	2, 362	3, 126	14, 641	39, 866	20, 231	6, 399	5, 294	4, 024	3, 277	2, 295	1, 615	509	103, 844
1925	483	2, 895	4, 330	20, 953	44, 941	20, 096	7, 372	6, 253	6, 855	6, 228	4, 114	2, 494	945	127, 909
1926 [2]	260	3, 840	3, 388	21, 022	45, 438	23, 349	8, 375	7, 969	8, 020	5, 347	3, 506	2, 355	888	133, 847
1927 [2]	253	1, 808	3, 541	11, 368	31, 935	16, 612	5, 881	------	------	------	-----	-----	-----	-------

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis.

[2] Preliminary.

TABLE 124.—*Apples: Cold-storage holdings, United States, 1915–1927*

BARRELS [1]

Year	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	Oct. 1	Nov. 1	Dec. 1
	1,000 barrels	*1,000 barrels*	*1,000 barrels*	*1,000 barrels*	*1,000 barrels*	*1,000 barrels*	*1,000 barrels*	*1,000 barrels*	*1,000 barrels*
Average:									
1916–1920	2, 890	2, 293	1, 605	955	434	127	--------	2, 925	3, 507
1921–1925	3, 604	2, 817	2, 012	1, 173	586	204	811	3, 712	4, 199
1915	2, 929	2, 438	1, 716	896	299	61	--------	3, 093	4, 213
1916	3, 743	3, 324	2, 543	1, 561	709	218	--------	2, 530	3, 166
1917	2, 680	2, 121	1, 560	1, 044	543	183	--------	2, 558	3, 195
1918	2, 754	2, 226	1, 575	978	356	101	--------	2, 915	3, 280
1919	2, 582	1, 704	962	487	198	68	824	3, 108	3, 326
1920	2, 693	2, 092	1, 385	705	274	64	452	3, 516	4, 570
1921	3, 966	3, 016	2, 020	1, 027	449	170	570	1, 822	1, 979
1922	1, 742	1, 424	996	561	248	74	1, 219	4, 133	4, 319
1923	3, 708	2, 839	2, 013	1, 199	578	150	664	4, 619	5, 477
1924	4, 962	3, 993	3, 024	1, 925	1, 113	451	543	3, 551	4, 167
1925	3, 643	2, 811	2, 006	1, 151	543	175	1, 058	4, 434	5, 051
1926	4, 556	3, 714	2, 667	1, 531	727	202	601	3, 933	5, 458
1927	4, 901	3, 857	2, 682	1, 603	828	205	690	2, 967	3, 357

BOXES

Year	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	Oct. 1	Nov. 1	Dec. 1
	1,000 boxes	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*
Average:									
1916–1920	5, 349	4, 644	3, 254	1, 916	923	259	--------	2, 808	5, 570
1921–1925	9, 986	8, 272	6, 170	4, 050	2, 055	710	809	6, 460	11, 075
1915	4, 091	3, 441	2, 323	1, 341	525	142	--------	1, 789	3, 685
1916	3, 210	2, 738	2, 096	1, 268	709	258	--------	2, 190	3, 977
1917	4, 356	3, 700	2, 646	1, 504	796	246	--------	2, 216	4, 483
1918	5, 534	5, 192	3, 764	2, 416	966	172	--------	2, 513	4, 945
1919	5, 137	4, 205	2, 431	1, 410	545	170	440	4, 244	7, 793
1920	8, 508	7, 296	5, 331	2, 982	1, 598	447	277	2, 878	6, 651
1921	7, 259	6, 266	4, 890	3, 548	2, 009	826	667	5, 464	11, 281
1922	11, 061	8, 667	6, 282	4, 107	2, 088	721	669	4, 164	7, 271
1923	8, 319	7, 612	5, 593	3, 345	1, 475	380	789	6, 886	13, 866
1924	14, 201	11, 550	8, 821	5, 837	2, 901	949	829	6, 620	9, 917
1925	9, 089	7, 264	5, 266	3, 412	1, 801	674	1, 091	9, 165	13, 041
1926	11, 868	10, 009	7, 898	5, 350	2, 892	1, 104	1, 809	9, 523	15, 083
1927	13, 305	10, 435	7, 298	4, 613	2, 312	717	1, 043	9, 074	13, 423

[1] All apples, except those packed in western-style boxes, are tabulated in terms of barrels, on the basis of 3 bushels to the barrel; since Oct. 1, 1923, apples packed in bushel baskets are also included in this tabulation. Three boxes are considered the equivalent of 1 barrel.

TABLE 124.—*Apples: Cold-storage holdings, United States, 1915–1927*—Contd.

TOTAL, IN BUSHELS

Year	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	Oct. 1	Nov. 1	Dec. 1
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
Average:									
1916–1920	14,020	11,524	8,069	4,780	2,224	640	--------	11,584	16,091
1921–1925	20,799	16,722	12,206	7,568	3,814	1,322	3,248	17,595	23,671
1915	12,879	10,755	7,473	4,029	1,422	324	--------	11,067	16,323
1916	14,439	12,708	9,726	5,952	3,105	912	--------	9,780	13,476
1917	12,396	10,155	7,326	4,635	2,424	795	--------	9,888	14,067
1918	13,797	11,871	8,490	5,349	2,034	477	--------	11,256	14,784
1919	12,882	9,315	5,316	2,868	1,140	375	2,913	13,569	17,769
1920	16,587	13,572	9,486	5,097	2,418	639	1,632	13,425	20,361
1921	19,158	15,315	10,950	6,630	3,357	1,335	2,376	10,929	17,217
1922	16,287	12,939	9,270	5,790	2,832	942	4,356	16,563	20,229
1923	19,443	16,128	11,631	6,942	3,210	831	2,781	20,742	30,297
1924	29,088	23,529	17,895	11,613	6,240	2,304	2,460	17,274	22,419
1925	20,019	15,699	11,283	6,864	3,429	1,197	4,266	22,467	28,194
1926	25,536	21,153	15,900	9,942	5,073	1,890	3,612	21,321	31,458
1927	28,068	22,005	15,342	9,423	4,794	1,602	3,114	17,976	23,493

Bureau of Agricultural Economics. Compiled from reports from cold-storage establishments.

TABLE 125.—*Apples:* [1] *International trade, average 1911–1913, annual 1923–1926*

Country	Year ended Dec. 31: Average, 1911-1913		1923		1924		1925		1926, preliminary	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
PRINCIPAL EXPORTING COUNTRIES	*1,000 barrels*	*1,000 barrels*	*1,000 barrels*	*1,000 barrels*	*1,000 barrels*	*1,000 barrels*	*1,000 barrels*	*1,000 barrels*	*1,000 barrels*	*1,000 barrels*
United States	(2)	3,290	44	2,959	32	4,120	28	3,348	18	5,390
Canada	280	1,286	185	1,609	177	1,524	153	1,337	182	1,193
France [3]	89	2,380	180	434	63	1,809	87	1,422	107	705
Netherlands	35	311	107	251	121	353	51	726	203	194
Belgium	264	312	41	263	104	328	100	433	60	366
Italy	13	220	(4)	153	(4)	333	(4)	379	-------	625
Rumania	2	(4)	(4)	13	(4)	140	(4)	361	(4 5)	[5] 78
New Zealand	[3] 17	[3] 5	6	41	13	68	13	59	201	10
Australia	26	380	-------	[6] 662	-------	[6] 455	-------	[6] 608	(4)	[6] 901
PRINCIPAL IMPORTING COUNTRIES										
United Kingdom	2,562	-------	4,827	-------	5,250	-------	4,385	-------	6,113	-------
Germany	4,818	31	505	14	3,767	26	2,860	23	2,774	5
Sweden	44	1	154	1	216	(4)	179	(4)	201	(4)
Denmark	36	1	131	(4)	132	(4)	131	(4)	207	(4)
Irish Free State	-------	-------	-------	-------	147	-------	163	-------	175	-------
Egypt [7]	(2)	(2)	162	1	162	1	112	(4)	119	(4)
Norway [3]	74	(4)	117	(4)	63	(4)	56	-------	63	-------
Finland	64	-------	49	-------	51	-------	47	-------	54	-------
Cuba	13	-------	30	-------	29	-------	30	-------	30	-------
Brazil	27	-------	17	-------	36	-------	47	-------	-------	-------
Poland	-------	-------	-------	-------	50	2	28	14	1	3
Total 20 countries	8,364	8,217	6,555	6,401	10,413	9,159	8,470	8,710	10,508	9,470

Bureau of Agricultural Economics. Official sources.

[1] Foreign weights are converted to barrels on the basis of 144 pounds per barrel.
[2] Not separately stated.
[3] Includes pears.
[4] Less than 500 barrels.
[5] 9 months.
[6] Year ended June 30.
[7] Includes pears prior to January, 1925.

TABLE 126.—*Apples: Estimated price per bushel, received by producers, United States, 1910–1927*

Year beginning June	June 15	July 15	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	Weighted av.
Average:	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
1910–1913	114.2	85.0	72.4	70.6	72.5	80.1	90.6	98.3	104.7	109.9	119.0	127.2	81.1
1914–1920	156.3	127.3	105.7	99.8	105.8	113.3	126.1	126.9	134.0	142.2	150.7	165.1	113.6
1921–1925	185.2	162.7	127.8	119.2	128.0	135.8	142.5	145.5	154.2	155.1	156.4	175.8	134.2
1910	112.0	76.9	73.8	73.6	77.4	89.3	100.2	115.7	118.6	124.7	138.8	139.6	88.1
1911	135.4	94.8	73.0	70.2	65.8	73.1	86.1	92.7	98.8	103.5	114.9	128.8	76.6
1912	108.0	82.5	67.5	62.2	61.3	63.5	72.6	74.3	78.4	82.4	85.0	94.0	66.8
1913	101.2	86.0	75.2	76.5	85.6	94.4	103.6	110.6	123.0	128.9	137.1	146.4	93.0
1914	135.6	91.2	68.6	61.6	56.0	57.3	66.6	69.3	73.1	73.4	80.1	90.6	62.7
1915	90.3	78.4	61.8	58.0	66.1	72.4	77.0	86.1	90.5	91.2	94.8	97.5	71.0
1916	104.9	86.5	80.7	75.6	82.5	92.0	103.4	104.3	114.4	126.9	137.1	142.9	90.7
1917	146.5	125.1	100.6	96.6	105.1	116.8	127.4	132.9	138.5	142.6	143.9	155.8	113.6
1918	144.6	125.7	114.5	118.9	129.4	138.9	150.9	148.9	159.8	190.1	203.5	220.8	137.5
1919	223.4	187.6	161.4	153.2	175.6	181.9	213.9	215.9	229.2	236.7	253.5	285.8	186.1
1920	249.1	196.7	152.1	134.8	125.9	130.7	143.2	130.8	132.8	134.7	142.2	162.3	133.8
1921	173.9	165.3	165.1	171.4	196.4	215.7	224.5	183.5	206.7	206.2	194.5	241.4	195.2
1922	202.7	181.7	100.4	94.3	93.4	101.5	108.6	131.5	142.3	144.9	156.5	178.7	109.4
1923	188.6	166.7	121.4	108.0	114.0	114.6	114.0	121.3	125.0	129.1	129.4	131.3	117.4
1924	159.3	141.3	121.6	109.8	115.9	119.5	128.2	144.9	150.7	155.4	158.4	179.2	122.1
1925	201.4	158.7	130.7	112.5	120.5	127.7	137.4	146.3	146.3	139.8	143.2	148.2	127.0
1926	168.7	133.8	103.8	88.4	80.2	81.6	87.7	97.3	98.8	100.0	103.8	113.5	88.3
1927	140.0	144.4	135.8	130.7	134.7	141.8	152.4						

Bureau of Agricultural Economics. Based upon returns from special price reporters.

TABLE 127.—*Apples: Average l. c. l. price to jobbers, 1921–1927* [1]

BARRELS [2]

Market, variety, and year	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
New York:									
Baldwin—	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
1921	[3] 6.61	7.15	7.55	7.89	7.48	7.61	7.68	7.84	
1922			4.24	4.67	4.66	4.78	5.23	5.63	6.94
1923			4.33	4.23	4.17	4.04	3.68	3.45	3.77
1924			5.31		6.52	6.89	6.27	6.73	
1925		4.50	4.79	4.52	3.95	3.80	3.43	3.62	4.18
1926			2.83	2.96	3.02	3.49	3.22	3.27	4.00
1927			5.93	6.31					
Rhode Island Greening—									
1921	7.48	9.36	9.40	9.33	10.05	10.77			
1922	3.74	3.99	4.42	4.47	4.29	4.63	5.26	6.43	
1923		5.73	5.97	5.67	4.91	4.49	4.47		
1924	4.64	5.10	6.26	6.38	6.29	6.50	7.11	7.72	
1925	4.59	4.92	5.12	5.06	4.80	4.55	4.41	5.69	
1926	2.86	2.80	3.18	3.49	3.55	3.94	3.74	4.27	
1927		6.48	7.80	8.00					
McIntosh—									
1924		7.64	8.51		9.94	11.68	12.91		
1925	7.00	7.35	7.93	8.26	8.14	7.57	7.80		
1926	5.51	6.76	7.11	7.86	7.37	[3] 8.75	[3] 8.41		
1927	7.31	7.72	8.86	9.24					
York Imperial—									
1922		3.94	3.93	4.22	4.36	5.57			
1923		3.33	3.47	3.81	3.61	3.78	4.42		
1924				5.22	5.77	6.61	6.82		
1925		4.31	4.89	5.34	5.22	5.62			
1926			2.62	2.86	2.82	2.99			
1927		[3] 5.32	5.73	6.13					
Chicago:									
Baldwin—									
1921		7.12	7.22	7.32	7.47	8.01	8.13	8.37	
1922		3.62	4.08	4.73	4.77	5.06	5.48	5.81	6.49
1923			4.25	4.25	[4] 4.55	4.50	4.45	4.08	
1924			5.84	6.16	6.44	6.73	6.86	6.61	
1925			4.78	4.61	4.63	4.53	3.94	3.94	4.04
1926			3.32	3.37	3.82	3.99	3.87	3.80	3.69
1927			6.68	6.85					

[1] Commodity reports began Sept. 7, 1921; Sept. 1, 1922, 1923, 1925; Sept. 2, 1924; July 14, 1926; Aug. 29, 1927. Last commodity report of season May 1, 1922; May 12, 1923; June 8, 1924; Apr. 15, 1925; May 29, 1926; May 28, 1927.
[2] Quotations on 2½-inch stock unless otherwise stated.
[3] Less than 10 quotations.
[4] Quotations on 2¼-inch stock.

TABLE 127.—*Apples: Average l. c. l. price to jobbers, 1921–1927*—Continued

BARRELS—Continued

Market, variety, and year	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
Chicago—Continued.									
Ben Davis—	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
1922					3.12	[5] 3.19	[5] 4.01	[5] 4.30	[5] 4.62
1923								2.95	
1924				4.09	4.43	5.24	5.46	5.75	
1925						[3] 3.29	3.25	3.17	3.42
1926						3.25	3.16	3.14	3.26
Rhode Island Greening—									
1921	8.35	8.11	8.75	9.22	10.63	10.78	[3] 10.60		
1922		4.17	4.48	5.16	4.75	5.05	5.52	5.88	
1923		[3] 4.70	5.20	5.28	[4] 5.12	5.31	5.25	4.77	
1924		6.02	6.68	6.90	6.92	7.17	7.22	7.30	
1925		4.79	5.21	5.05	5.26	5.09	4.75	5.38	6.25
1926		3.88	3.82	4.15	4.31	4.62	4.58	[3] 4.66	
1927		7.37	8.76	9.64					
Jonathan—									
1921		8.86	8.57	8.07					
1922	4.15	5.34	5.56	5.52	[5] 5.38	[5] 5.35	[5] 5.87		
1923	6.19	5.75	5.76	5.27	5.25	5.63			
1924	6.72	7.53	7.65	7.99	8.60	8.75			
1925	6.08		6.24		6.13		5.25		
1926		4.41	4.25	4.70	5.26	5.45			
1927	7.83	7.63	8.53	8.78					
King (Tompkins)—									
1922		3.88	4.48	5.33	5.10	5.25	[3] 5.33		
1923			5.17			[3] 4.30			
1924			6.37	6.35	6.25	6.74	6.75		
1925			5.46	5.26	5.25	5.11			
1926			3.74	3.65	3.85	3.75	3.66		
Northern Spy—									
1921				7.37	7.83	9.38	9.89		
1922		3.60	4.37	5.62	5.44	5.97	6.14		
1923			5.59	5.75	5.75	5.95	5.66	5.40	5.30
1924			7.89	6.82	6.85	7.33	8.19	8.25	
1925				5.08		5.55	5.25	5.26	6.74
1926			5.50	5.94					
1927			9.35	9.98					

BOXES [6]

Market, variety, and year	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
New York:									
Rome Beauty—									
1921		2.99	2.51	2.59	2.68	2.91	[7] 3.26		
1922				1.68	[7] 2.10	1.74	2.22	[7] 2.28	
1923 [7]				1.74	1.68	[3] 1.62	[3] 1.62		
1924 [7]		2.46	2.60	2.65	2.85				
1925			[7] 2.30	[7] 2.65	[7] 2.24	[3] 2.13	[7] 2.05		
1926				[3] [7] 1.69					
Winesap—									
1921							3.41	3.39	
1922				[3] [7] 2.22	[7] 2.58	[7] 2.45	2.27	2.80	3.27
1923					2.15	[7] 2.04	2.10	2.12	2.21
1924 [3]					[7] 3.46	[7] 3.41	3.51	[7] 3.80	
1925				[3] [7] 2.49	[7] 2.66	[7] 2.38	[7] 2.31	[7] 2.23	[3] 2.46
1926 [7]								2.47	2.71
Chicago:									
Delicious—									
1921		4.07	3.72	3.46	3.77	3.97	3.86	4.07	
1922		3.19	2.66	2.74	[7] 2.76	2.97	[7] 3.50	[7] 4.06	
1923		2.84	2.81	2.99	3.00	3.16	3.26	3.23	3.48
1924		4.02	4.00	4.22	4.25	3.88	3.84	4.22	
1925 [7]				3.41	3.55	3.52	3.97	4.64	4.88
1926 [7]				2.99	3.24	3.03	3.20	3.33	3.71
1927		[7] 3.86	[7] 3.88	4.35					
Jonathan—									
1921		2.62	2.51	2.68	2.61	3.06	3.24		
1922		2.39	2.00	2.09	[7] 2.14	2.13			
1923	3.11	2.10	1.99	2.05	2.05	2.37	2.41		
1924	3.09	2.87	2.99	3.10	3.22				
1925				2.83	2.86	2.54	2.40		
1926				2.20	2.75	2.74			
1927		[7] 2.79	[7] 3.11						

[3] Less than 10 quotations.
[4] Quotations on 2¼-inch stock.
[5] Quoted as United States No. 1 grade.
[6] Quotations on medium-large stock unless otherwise stated.
[7] Quotations include very large stock.

TABLE 127.—*Apples: Average l. c. l. price to jobbers, 1921–1927*—Continued

BOXES—Continued

Market, variety, and year	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
Chicago—Continued.									
Rome Beauty—	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
1921			2.73	2.61	2.94	2.98	3.00		
1922			2.61	2.23	[7] 2.16	2.10	2.36	2.47	
1923		2.33	2.21		1.90	1.83	1.75	1.80	2.00
1924			[8] 2.88	2.95	3.42	3.36	3.17	3.79	
1925 [7]				2.53	2.62	2.36	2.22	2.30	2.38
1926 [7]				1.91	2.32	2.35	2.65	2.66	2.71
1927		[7] 3.62	[7] 3.19	3.23					
Winesap—									
1921							3.15	3.05	
1922					2.27	2.27	2.38	2.49	2.67
1923						2.23	2.25	2.19	2.27
1924				3.30	3.30	3.68	3.75	3.59	
1925 [7]					2.77	2.49	2.39	2.38	2.38
1926						[7] 2.62	[7] 2.72	2.75	2.88

Bureau of Agricultural Economics. Compiled from daily market reports from bureau representatives at these markets. Average prices as shown are based on stock of good merchantable quality and condition; they are simple averages of daily range of selling prices.

[8] Less than 10 quotations. [7] Quotations include very large stock.

TABLE 128.—*Apples: Average l. c. l. price per barrel to jobbers at New York, 1909–1927* [1]

Season beginning September	September	October	November	December	January	February	March	April	May
Average:	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
1909–1913	3.14	3.49	3.35	3.51	3.51	3.65	3.77	4.30	4.43
1914–1920	4.07	4.58	4.89	4.91	4.88	5.33	5.72	5.98	6.67
1921–1925	5.22	5.78	5.77	5.87	6.15	6.36	6.20	6.38	
1909	3.72	4.22	3.81	3.69	3.82	3.21	3.28	3.48	3.71
1910	3.50	3.65	3.75	4.14	4.12	4.50	4.75	5.35	5.31
1911	2.55	3.06	2.71	3.12	2.84	2.96	3.39	4.20	4.00
1912	2.66	3.06	2.75	2.62	2.71	2.78	2.70	3.12	4.00
1913	3.29	3.44	3.75	4.00	4.06	4.79	4.75	5.34	5.14
1914	2.38	2.22	2.78	3.12	2.80	2.91	2.84	3.56	3.65
1915	2.38	2.95	3.12	3.06	3.05	3.19	3.33	3.12	2.96
1916	3.30	3.38	4.18	4.60	5.00	5.38	5.91	5.53	5.28
1917	4.08	4.44	4.94	5.10	5.00	4.88	4.92	5.75	6.75
1918	5.38	6.03	5.98	6.31	6.50	7.88	9.55	10.00	10.80
1919	6.12	7.81	7.55	7.50	7.00	8.06	7.50	7.08	9.25
1920	4.86	5.23	5.66	4.71	4.80	5.01	6.01	6.79	8.03
1921	8.09	7.72	7.18	7.82	8.23	8.62	7.64	7.44	
1922	3.53	4.63	4.94	4.67	5.08	5.09	5.37	6.03	6.75
1923	5.16	4.80	4.58	4.71	4.46	4.59	4.50	4.82	4.20
1924	4.53	5.82	6.51	6.21	7.16	7.84	7.82	7.80	
1925	4.79	5.93	5.63	5.92	5.81	5.65	5.09	5.82	6.02
1926	3.54	4.88	3.96	4.46	4.50	4.51	4.47	4.17	5.20
1927	5.82	6.84	7.64	7.61					

Bureau of Agricultural Economics. September, 1909, to May, 1920, compiled from the American Agriculturist, average of weekly range; subsequently compiled from daily market reports from bureau representative at New York; simple average of daily range of selling prices. Since all varieties are included, these figures can be taken only as an index of the changes in the level of apple prices.

[1] The average price for season 1921–22 is 8 per cent higher than the average of American Agriculturist prices for that season; 1922–23, 8 per cent lower, and for 1923–24, 4 per cent higher. Price quotations in the American Agriculturist were discontinued May, 1924.

TABLE 129.—*Baldwin apples: Average price per barrel, Boston, 1878–1927*

FROM BOSTON CHAMBER OF COMMERCE REPORTS [1]

Year beginning October—	October	November	December	January	February	March	April	May	Average, November to April
	Dollars	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
1878	1.14	1.12	1.12	1.17	1.37	1.37	1.56	1.85	1.28
1879	-------	2.34	2.38	2.50	2.90	3.09	3.30	4.12	2.56
1880	1.12	1.12	1.35	1.47	1.70	1.43	2.05	2.41	1.52
1881	2.33	2.93	2.67	2.81	3.22	3.02	3.56	-------	3.03
1882	-------	2.75	3.22	3.44	3.62	3.75	3.75	4.41	3.42
1883	-------	3.37	3.37	3.52	3.75	4.03	4.40	5.00	3.74
1884	1.37	1.56	1.67	1.92	2.31	2.46	2.62	3.00	2.09
1885	1.58	1.50	1.62	1.70	1.50	1.50	1.45	-------	1.54
1886	1.48	1.42	1.81	2.00	2.12	2.77	3.97	-------	2.35
1887	-------	1.94	2.20	2.62	2.87	2.92	3.12	3.50	2.61
1888	1.34	1.31	1.12	1.06	1.06	1.14	1.35	1.92	1.17
1889	2.06	2.25	2.78	2.84	3.50	3.93	4.12	-------	3.24
1890	3.31	3.87	3.97	4.37	4.62	4.84	4.72	4.50	4.40
1891	1.62	1.56	1.50	1.62	1.69	2.00	2.31	3.37	1.78
1892	1.87	2.00	2.00	2.25	2.47	2.67	2.47	2.62	2.31
1893	2.75	2.87	3.55	4.06	4.62	5.40	4.75	-------	4.21
1894	1.62	1.62	1.75	2.52	2.87	2.75	2.88	3.25	2.40
1895	-------	2.43	2.75	3.02	3.06	3.72	3.62	2.75	3.10
1896	.87	.87	.87	.87	1.25	1.06	1.27	1.78	1.03
1897	2.33	2.75	3.10	3.50	3.50	3.27	3.25	3.25	3.23
1898	2.25	2.44	2.85	3.00	3.15	3.55	4.12	4.75	3.18
1899	2.25	2.25	2.47	2.72	2.87	3.57	3.75	3.90	2.94
1900	1.37	1.53	2.00	2.12	2.28	2.69	3.03	3.40	2.28
1901	3.19	3.56	3.75	3.85	4.19	4.43	4.62	4.75	4.07
1902	1.78	1.65	1.53	2.05	2.03	2.03	2.27	2.47	1.93
1903	2.12	2.19	2.37	2.59	2.78	2.37	2.12	1.88	2.40
1904	1.21	1.62	1.90	2.12	2.12	1.97	2.00	2.12	1.96
1905	2.06	2.78	3.05	3.25	3.50	4.45	4.50	4.50	3.59
1906	2.12	2.17	2.42	2.25	2.31	2.59	2.90	4.10	2.44
1907	3.00	2.62	2.37	2.37	2.25	2.25	2.25	1.87	2.35
1908	2.12	2.53	3.37	3.88	4.44	4.50	5.20	5.53	3.99
1909	2.88	2.75	2.75	3.00	3.00	3.20	3.25	3.25	2.90
1910	2.75	2.77	2.87	3.46	4.00	4.25	4.75	4.90	3.68
1911	2.29	2.49	2.25	2.25	2.53	2.87	3.00	3.62	2.56
1912	2.03	1.71	1.87	2.37	2.49	2.62	2.62	2.99	2.28
1913	2.92	3.15	3.35	3.93	4.12	4.50	4.65	5.25	3.95
1914	1.66	1.75	1.90	1.90	1.87	2.17	2.88	3.06	2.08
1915	3.00	2.68	2.25	2.25	2.43	2.37	2.18	1.89	2.36
1916	2.38	2.38	2.65	3.35	3.88	4.25	4.15	3.87	3.44
1917	4.25	3.90	3.75	4.25	4.75	4.75	5.00	5.25	4.40
1918	3.80	3.94	4.75	5.30	7.00	7.62	7.00	-------	5.94
1919	5.25	5.56	6.05	6.25	6.62	7.80	8.00	8.00	6.71
1920	3.25	4.00	4.00	4.12	4.00	4.10	3.88	3.75	4.02
1921	5.75	5.85	6.19	6.81	7.00	7.05	7.25	7.15	6.69
1922	-------	3.32	4.18	4.70	5.25	6.00	5.56	6.87	4.84
1923	-------	3.44	3.50	3.15	3.12	3.12	3.12	4.00	3.24
1924	3.75	3.75	4.25	4.75	5.50	5.38	6.30	6.50	4.90
FROM BUREAU OF AGRICULTURAL ECONOMICS [2]									
1923	-------	3.44	4.25	3.90	4.16	4.56	3.82	3.92	4.02
1924	5.00	3.97	4.25	5.00	5.06	4.90	5.50	-------	4.78
1925	4.50	3.83	3.79	4.00	4.46	3.60	3.84	4.00	3.92
1926	-------	2.75	-------	3.25	3.12	3.38	3.62	3.75	-------
1927	-------	-------	5.05	-------	-------	-------	-------	-------	-------

Bureau of Agricultural Economics.

[1] Average of weekly quotations of price actually paid by wholesale dealers on days quoted.

[2] Average of l. c. l. price for United States No. 1, one day weekly, as reported by bureau representative in the market.

TABLE 130.—*Citrus fruit production, by States, 1889, 1899, 1909, 1919–1927* [1]

ORANGES [2]

State	1889 [3]	1899 [3]	1909 [3]	1919	1920	1921	1922	1923	1924	1925	1926	1927 [4]
	1,000 boxes	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*
California	1,245	5,882	14,440	15,265	21,296	12,640	20,106	24,137	18,100	24,200	28,167	22,540
Florida [5]	3,147	273	4,888	-------	-------	-------	10,200	12,900	11,600	9,100	10,700	10,000
Arizona	-------	11	33	80	60	80	81	86	60	86	75	-------
Alabama	-------	(6)	1	41	165	165	350	450	1	200	150	-------
Louisiana	-------	1	152	37	42	50	60	75	75	100	150	200
Mississippi	-------	-------	5	31	25	30	45	55	0	27	42	-------
Texas	-------	-------	11	9	-------	-------	4	6	12	10	20	30

GRAPEFRUIT

State	1889	1899	1909	1919	1920	1921	1922	1923	1924	1925	1926	1927
California	-------	18	123	263	304	360	394	363	387	600	650	720
Florida [5]	20	12	1,062	-------	-------	-------	7,600	8,400	8,600	7,300	7,800	6,300
Mississippi	-------	-------	1	(6)	1	1	1	1	0	1	1	-------
Arizona	-------	1	1	29	34	35	44	65	67	90	75	-------
Louisiana	-------	-------	2	(6)	-------	-------	-------	-------	-------	-------	-------	-------
Texas	-------	-------	(6)	3	-------	-------	35	65	211	200	340	490

LEMONS

State	1889	1899	1909	1919	1920	1921	1922	1923	1924	1925	1926	1927
California	306	874	2,756	3,499	4,955	4,050	3,400	6,732	5,125	7,136	7,712	6,400
Florida	253	2	12	32	-------	-------	-------	-------	-------	-------	-------	-------
Arizona	-------	(6)	1	2	-------	-------	-------	-------	-------	-------	-------	-------

Bureau of Agricultural Economics.

1 The figures in this table of production include fruit consumed on farms, sold locally, and used for manufacturing purposes, as well as that shipped. The figures do not include fruit which ripened on the trees but which was destroyed by freezing or storms prior to picking. For California the figures relate to the crop produced from the bloom of the year shown, fruiting through the winter and through the spring and summer of the following year, being picked from Nov. 1 of the year shown to Oct. 31 of the following year. Fruit not picked until after the latter date is included with the crop of the following year. For all States except California the estimates include all fruit picked after about Sept. 1 of the year shown.

2 Including tangerines.

3 Data from census reports.

4 As estimated from prospects on Dec. 1.

5 From prospects on Dec. 1, commercial shipments of Florida citrus from the 1927 crop were estimated at 9,200,000 boxes of oranges, and 5,300,000 boxes of grapefruit, compared with 9,600,000 boxes of oranges and 7,000,000 boxes of grapefruit shipped from the 1926 crop.

6 Less than 500 boxes.

TABLE 131.—*Citrus fruits: Car-lot shipments, by State of origin, 1920–1926*

ORANGES [1]

State	Crop-movement season [2]						
	1920	1921	1922	1923	1924	1925	1926 [3]
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
California	46,844	28,376	48,346	44,905	34,439	47,017	53,347
Florida	20,859	[4] 15,718	23,006	33,418	25,091	19,625	22,592
Alabama	87	145	476	600	2	338	179
Mississippi	---------	---------	9	13	---------	8	4
Louisiana	---------	---------	---------	3	2	1	1
Texas	---------	---------	---------	3	3	6	9
Arizona	49	78	71	94	45	96	73
Total	67,839	[4] 44,317	71,908	79,036	59,582	67,091	76,205

1 Includes tangerines.

2 Crop movement season extends as follows: Oranges.—From Sept. 1 of one year through August of the following year, except in California, where the season extends from Nov. 1 through October of the following year. Grapefruit.—From Sept. 1 of one year through August of the following year. Lemons.—From Nov. 1 of one year through October of the following year. Mixed citrus.—From Sept. 1 of one year through August of the following year, except in California, where the season extends from Nov. 1 through October of the following year.

3 Preliminary.

4 Includes one car in August, 1921.

TABLE 131.—*Citrus fruits: Car-lot shipments, by State of origin, 1920–1926*—Continued

GRAPEFRUIT

State	Crop-movement season						
	1920	1921	1922	1923	1924	1925	1926
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
Florida	11,115	12,943	16,969	19,614	20,087	14,269	17,272
Texas		8	48	99	521	298	747
California	451	503	507	469	449	546	591
Arizona	48	62	103	155	159	218	210
Total	11,614	13,516	17,627	20,337	21,216	15,331	18,820

LEMONS

State	1920	1921	1922	1923	1924	1925	1926
California	11,836	9,907	8,946	13,388	11,680	13,081	13,294
Texas				1	[5] 2		
Arizona			1	2	1	1	
Total	11,836	9,907	8,947	13,391	11,683	13,082	13,294

MIXED CITRUS [6]

State	1920	1921	1922	1923	1924	1925	1926
Florida			2,631	3,608	4,226	3,565	5,226
California			1,033	1,461	1,148	1,605	1,608
Texas			18	1	18		22
Arizona			3		10	1	10
Total			3,685	5,070	5,402	5,171	6,866

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis.

[5] Reported in October, 1924.

[6] No reports available before 1922.

TABLE 132.—*Lemons: International trade, average 1911–1913, annual 1923–1926*

[Boxes of 74 pounds]

Country	Year ended Dec. 31									
	Average, 1911–1913		1923		1924		1925		1926, preliminary	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
PRINCIPAL EXPORTING COUNTRIES	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*
Italy	2	8,147	1	4,198	1	5,236	1	7,078		7,008
Spain		101		291		213		656		372
PRINCIPAL IMPORTING COUNTRIES										
United Kingdom	[1] 1,116		1,393		[1] 1,781		1,895		[1] 1,942	
Germany	[2] 1,107	(3)	387	(3)	1,201	(3)	1,531	(3)	1,615	(3)
United States	[2] 1,750	[4] 66	1,702	182	634	228	1,572	162	909	206
Belgium [5]	763		920	3	1,058	7	804	3	1,016	4
Czechoslovakia			237		295		408		449	
Poland					248	1	293		214	
Rumania	123		168		183		198		[6] 157	
Netherlands	94	3	158	11	178	18	179	18	187	19
Switzerland	(3)		126		120		140		146	
Hungary	[7] 1,032	[7] 228	[1] 54		113		131		114	
Total 12 countries	5,987	8,545	5,146	4,685	5,812	5,703	7,152	7,017	6,869	7,699

Bureau of Agricultural Economics. Official sources.

[1] Includes small quantities of other citrus fruit

[2] 2-year average.

[3] Not separately classified.

[4] 1 year only.

[5] Lemons, oranges, citrons, etc.

[6] 9 months.

[7] Average for Austria-Hungary.

TABLE 133.—*Oranges: International trade, average 1911–1913, annual 1923–1926*

[Boxes of 78 pounds]

Country	Year ended Dec. 31									
	Average, 1911–1913		1923		1924		1925		1926, preliminary	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
PRINCIPAL EXPORTING COUNTRIES	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*
Spain		14,830	1	13,030		18,958		20,199		20,265
Italy	3	3,476		2,299		3,485	1	4,077	1	3,835
United States	[1] 73	1,154	93	2,294	15	2,564	14	1,981	12	2,692
Palestine				[2] 321		1,781		1,848		1,885
Union of South Africa		(3)		359		399		660		563
Japan		353		370		277		369		491
Cuba		111		259		270		245		322
China	(4)	(4)	(4)	236	253	384	359	233	526	231
Brazil		2		406		448		499		
PRINCIPAL IMPORTING COUNTRIES										
United Kingdom	7,638		10,714		10,395		10,788		11,160	
Germany	3,935		384		4,425		5,899		5,375	
France [5]	3,198	38	3,780	61	4,186	152	3,872	122	3,964	102
Netherlands	631	9	1,204	67	2,109	779	1,850	561	1,717	456
Czechoslovakia			107		120		430		460	
Switzerland	372		341		367		374		437	
Norway [5]	208		379		297		338		366	
Sweden	166		247		231		265		320	
Irish Free State					245		234		244	
Denmark	97		258		238		230		229	
Hungary	[6] 2,110	[6] 102			52		236		220	
Poland					635		638		177	1
Egypt	(4)		611	5	502	4	501	3	315	3
Total 22 countries	18,431	20,075	18,179	19,707	24,070	29,501	26,029	30,797	25,523	30,846

Bureau of Agricultural Economics. Official sources.

[1] 2-year average.
[2] 6 months.
[3] Expressed in value only.
[4] Not separately stated.
[5] Includes lemons.
[6] Average for Austria-Hungary.

TABLE 134.—*Grapefruit, Florida: Average auction price per box at New York, 1919–1927*

Season beginning October	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Average
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1919	3.72	3.67	3.29	3.46	3.28	3.60	4.05	5.02	[1] 2.61	[1] 6.20	[2] 3.70
1920	5.31	4.71	3.92	4.86	4.30	4.71	4.55	4.54	4.21	[1] 4.33	[2] 4.55
1921	3.37	3.52	3.86	3.47	3.78	3.91	4.46	5.20	6.18	[1] 5.22	[2] 4.03
1922	3.75	3.84	4.00	3.73	3.96	3.63	3.98	3.48	3.26	2.96	3.70
1923	2.89	2.80	2.91	3.00	2.86	3.15	3.02	3.45	2.72	3.06	2.98
1924	4.10	2.99	2.39	2.94	3.00	2.90	4.04	4.50	5.99		3.38
1925	4.93	3.95	4.03	4.05	4.07	4.78	5.37	5.07	4.85	6.06	4.50
1926	[1] 5.21	4.20	3.57	3.74	4.01	4.01	4.01	3.99	4.00	2.89	3.94
1927	4.72	4.93	4.99								

Bureau of Agricultural Economics. Compiled from New York Daily Fruit Reporter.
Monthly average obtained by taking simple average of reported averages of all sales of "golden" grade. Includes all sizes. Yearly average weighted by number of sales reported during each month.

[1] 10 sales or less during month. [2] See footnotes to figures used in obtaining this average.

TABLE 135.—*Lemons, California: Average auction price per box at New York, 1919–1927*

Season beginning October	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Average
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1919	7.33	3.79	2.45	2.25	6.00	3.81	3.76	3.12	2.60	1.87	3.18	2.61	3.59
1920	4.73	2.78	3.04	3.39	4.11	3.14	2.91	3.82	8.17	8.99	3.72	5.87	4.64
1921	4.96	3.40	4.34	4.79	4.68	4.15	3.84	4.95	4.50	3.45	4.37	8.52	4.38
1922	8.51	7.44	5.61	5.01	5.42	4.20	4.79	6.12	7.92	6.07	7.68	7.28	6.25
1923	4.40	3.31	3.42	3.01	3.37	3.37	3.51	3.18	3.40	2.80	4.80	4.65	3.56
1924	4.90	6.80	4.65	4.45	4.30	4.51	4.76	5.71	6.52	4.48	4.50	8.87	5.36
1925	6.73	4.10	4.37	3.86	4.10	5.45	4.14	4.79	3.76	4.70	4.17	3.60	4.51
1926	4.46	3.86	4.08	4.14	3.43	3.96	3.54	3.92	4.58	6.34	6.44	8.40	4.20
1927	8.88	6.81	6.07	------	------	------	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Compiled from New York Daily Fruit Reporter.

Monthly average obtained by taking simple average of reported averages of all sales. Includes all sizes and grades. Yearly average weighted by number of sales reported during each month.

TABLE 136.—*Oranges, California navel: Average auction price per box of certain brands at New York, 1919–1927*

Season beginning December	December	January	February	March	April	May	June	Average
	Dollars	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
1919	5.80	[1] 5.98	[1] 6.39	5.13	7.10	5.71	4.76	[2] 5.70
1920	5.79	4.96	3.56	4.20	4.41	5.01	5.71	4.63
1921	6.46	4.64	[1] 4.81	6.51	[1] 6.97	[1] 6.78	----------	[2] 6.07
1922	5.00	4.34	4.17	3.91	4.60	4.61	4.67	4.45
1923	4.44	3.50	3.50	3.23	4.05	3.49	[1] 4.35	[2] 3.67
1924	4.71	5.32	4.98	5.76	5.72	7.05	6.74	5.94
1925 [3]	4.67	[1] 5.08	4.69	4.77	5.74	4.98	----------	5.23
1926	5.50	5.36	4.86	4.94	5.36	5.06	----------	5.15
1927	6.16	----------	----------	----------	----------	----------	----------	----------

Bureau of Agricultural Economics. Compiled from New York Daily Fruit Reporter.

Monthly average obtained by taking simple average of reported averages of all sales of the following-named brands: Paul Neyron, Golden Cross, Glendora Heights, Pinnacle, Earlibest, and Big Tree. Includes all sizes. Yearly average weighted by number of sales reported during each month.

[1] 10 sales or less during month.

[2] See footnotes to figures used in obtaining this average.

[3] In 1925 the season began in November, with an average price of $7.03.

TABLE 137.—*Oranges, California Valencia: Average auction price per box of certain brands at New York, 1919–1927*

Season beginning May	May	June	July	August	September	October	November	December	Average
	Dollars	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
1919	[1] 6.03	5.56	5.49	5.90	5.91	6.63	5.56	5.24	[2] 5.69
1920	4.91	6.52	7.05	7.57	7.88	7.91	9.22	[1] 8.67	[2] 7.56
1921	5.08	5.76	5.35	6.24	6.23	6.82	6.31	---------	6.09
1922	7.86	8.42	9.33	8.95	9.09	8.45	5.04	[1] 5.90	[2] 8.13
1923	4.81	5.65	4.77	4.45	5.56	5.87	6.89	---------	5.36
1924	4.34	4.97	4.57	5.81	5.92	6.64	6.53	[1] 5.19	[2] 5.70
1925	7.36	8.28	7.41	7.51	8.55	9.58	---------	---------	8.12
1926	4.74	4.71	5.31	5.32	6.09	6.93	7.50	---------	5.80
1927	4.41	5.15	6.08	6.70	7.78	7.93	7.90	---------	6.39

Bureau of Agricultural Economics. Compiled from New York Daily Fruit Reporter.

Monthly average obtained by taking simple average of reported averages of all sales of the following-named brands: Carmencita, Shamrock, Bird Rocks, Bowman, Advance, and Premium. Includes all sizes. Yearly average weighted by number of sales reported during each month.

[1] 10 sales or less during month. [2] See footnotes to figures used in obtaining this average.

TABLE 138.—*Oranges, Florida: Average auction price per box at New York, 1919–1927*

Season beginning October	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Average
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1919	[1] 3.16	2.80	3.95	4.22	6.43	6.63	9.40	8.32			[2] 5.91
1920	[1] 5.47	4.65	3.17	4.37	3.94	4.20	4.82	5.56	[1] 4.88	[1] 3.51	[2] 4.17
1921	3.06	4.18	4.29	3.95	4.85	6.68	7.15	8.06	8.99	[1] 9.79	[2] 4.44
1922	3.69	3.88	4.08	4.53	4.34	4.72	5.07	5.47	4.45	3.90	4.65
1923	[1] 3.11	3.55	2.68	2.84	3.02	3.16	3.51	3.85	4.88	[1] 4.81	[2] 3.27
1924		3.63	3.57	3.68	4.43	5.87	6.43	7.76	8.44		4.89
1925	7.80	6.80	4.09	4.23	4.41	4.95	5.82	5.91	6.54	[1] 7.45	5.07
1926	3.51	4.78	3.49	3.87	4.04	4.39	5.21	4.89	4.62	3.18	4.47
1927	3.31	6.10	5.81								

Bureau of Agricultural Economics. Compiled from New York Daily Fruit Reporter.
Monthly average obtained by taking simple average of reported averages of all sales of "golden" grade. Includes all sizes. Yearly average weighted by number of sales reported during each month.

[1] 10 sales or less during month. [2] See footnotes to figures used in obtaining this average.

TABLE 139.—*Cranberries: Production and farm value, United States, 1914–1927*

Year	Production	Price per barrel received by producers, Dec. 1	Farm value	Year	Production	Price per barrel received by producers, Dec. 1	Farm value
	1,000 bbls.	*Dollars*	*1,000 dolls.*		*1,000 bbls.*	*Dollars*	*1,000 dolls.*
1914	697	3.97	2,766	1921	384	16.99	6,526
1915	441	6.59	2,908	1922	560	10.18	5,702
1916	471	7.32	3,449	1923	652	7.15	4,664
1917	249	10.24	2,550	1924	582	9.42	5,485
1918	352	10.77	3,791	1925	569	11.20	6,370
1919	549	8.37	4,597	1926	744	7.56	5,623
1920	449	12.28	5,514	1927 [1]	495	12.28	6,077

Bureau of Agricultural Economics. Production figures are estimates of the crop-reporting board. Prices are based upon returns from special price reporters.

[1] Preliminary.

TABLE 140.—*Cranberries: Production and December 1 price, by States, 1923–1927*

State	Production					Price per barrel received by producers Dec. 1				
	1923	1924	1925	1926	1927 [1]	1923	1924	1925	1926	1927
	Barrels	*Barrels*	*Barrels*	*Barrels*	*Barrels*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
Massachusetts	410,000	325,000	420,000	430,000	370,000	6.50	9.90	11.25	7.75	12.50
New Jersey	205,000	215,000	115,000	210,000	75,000	8.00	8.75	10.75	7.00	11.00
Wisconsin	37,000	42,000	25,000	80,000	24,000	9.70	9.20	12.32	8.00	13.50
Washington				16,600	20,000				7.80	12.00
Oregon				7,000	6,000				7.50	10.50
United States	652,000	582,000	560,000	743,600	495,000	7.15	9.42	11.20	7.56	12.28

Bureau of Agricultural Economics.
Production figures are estimates of the crop-reporting board.
Prices are based upon returns from special price reporters.

[1] Preliminary.

TABLE 141.—*Cranberries: Car-lot shipments by State of origin, 1920–1926*

State	Crop movement season [1]						
	1920	1921	1922	1923	1924	1925	1926 [2]
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
Massachusetts	966	644	999	1,324	1,045	[3] 1,457	3,762
New Jersey	452	637	789	713	806	427	797
Wisconsin	82	68	223	140	150	73	309
Other States	2	4	5	6	12	40	34
Total	1,502	1,353	2,016	2,183	2,013	[3] 1,997	4,902

Bureau of Agricultural Economics. Compiled from monthly reports received by the bureau from local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis.

[1] Crop movement season extends from Sept. 1 of one year through April of the following year.
[2] Preliminary.
[3] Includes 1 car in August.

TABLE 142.—*Grapevines: Bearing and nonbearing, by States and districts, census years, 1910–1925*

State and district	1910			1920			1925 [1]
	Bearing	Nonbearing	Total	Bearing	Nonbearing	Total	Vines of all ages
	Thousands	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
California:							
Central district	70,965	23,261	94,226	95,166	18,641	113,807	190,949
Northern district	58,804	15,111	73,915	47,044	2,083	49,127	65,376
Southern district	14,030	859	14,889	10,738	637	11,375	22,471
Imperial Valley	299	295	594	247	28	275	1,843
Total	144,098	39,526	183,624	153,195	21,389	174,584	280,639
Great Lakes States:							
New York	31,802	3,802	35,604	30,678	1,389	32,067	34,874
Michigan	11,914	1,870	13,784	11,098	607	11,705	17,219
Pennsylvania	5,271	1,023	6,294	7,462	402	7,864	7,779
Ohio	8,327	456	8,783	6,554	521	7,075	8,780
Total	57,314	7,151	64,465	55,792	2,919	58,711	68,652
Central Western States:							
Missouri	3,027	486	3,513	2,445	411	2,856	5,189
Arkansas	806	178	984	607	101	708	4,312
Illinois	2,170	288	2,458	1,643	180	1,823	2,312
Iowa	1,983	446	2,429	1,402	305	1,707	2,115
Kansas	2,890	343	3,233	1,207	183	1,390	2,035
Total	10,876	1,741	12,617	7,304	1,180	8,484	15,963
All other States	12,314	4,281	16,595	9,463	1,906	11,369	16,237
United States	224,602	52,699	277,301	225,754	27,394	253,148	381,491

Bureau of Agricultural Economics. Figures for California districts from Bulletin 429, ECONOMIC STATUS OF THE GRAPE INDUSTRY. Calif. Col. Agr., p. 12. All other data from reports of the Bureau of the Census.

[1] Bearing and nonbearing vines not separately stated.

TABLE 143.—*Grapes: Estimated production, by States, 1924–1927*

State	1924	1925	1926	1927 [1]	State	1924	1925	1926	1927 [1]
	Tons	*Tons*	*Tons*	*Tons*		*Tons*	*Tons*	*Tons*	*Tons*
Me	38	48	49	58	N. C	6,600	4,950	6,840	5,135
N. H	84	95	96	91	S. C	1,425	1,078	1,785	1,540
Vt	37	49	36	45	Ga	1,638	1,470	1,892	1,472
Mass	440	473	616	555	Fla	----------	----------	700	610
R. I	289	300	212	152	Ky	1,094	972	1,274	632
Conn	1,075	1,063	1,275	1,087	Tenn	1,496	1,278	1,672	950
N. Y	80,000	51,840	106,700	51,520	Ala	825	880	913	627
N. J	2,338	2,200	2,820	2,535	Miss	281	285	300	225
Pa	19,750	11,180	25,110	14,850	Ark	3,000	4,400	13,000	3,000
Ohio	20,400	13,750	29,100	20,000	La	36	42	42	30
Ind	3,185	2,450	4,606	2,580	Okla	1,875	1,750	1,800	1,732
Ill	4,900	3,360	6,532	3,440	Tex	1,320	940	1,200	1,260
Mich	64,000	22,100	60,900	51,700	Idaho	240	270	300	304
Wis	279	248	409	250	Colo	280	260	320	314
Minn	88	30	85	152	N. Mex	520	475	531	458
Iowa	4,658	2,835	6,052	5,329	Ariz	350	419	900	1,900
Mo	5,840	7,300	12,880	7,000	Utah	1,000	1,000	1,300	1,320
Nebr	1,068	770	1,584	1,955	Nev	225	240	230	270
Kans	2,925	2,216	3,700	3,735	Wash	1,732	3,100	2,500	3,200
Del	1,400	1,275	1,536	1,207	Oreg	1,333	1,500	1,800	3,500
Md	770	781	1,330	1,224	Calif	1,535,000	[2] 1,912,000	[2] 2,114,000	[2] 2,264,000
Va	2,349	1,653	2,790	2,048					
W. Va	1,539	760	1,696	720	U. S	1,777,722	2,064,085	2,423,413	2,464,712

Bureau of Agricultural Economics.
Estimates of the crop-reporting board.

[1] Preliminary.
[2] The totals shown for California are exclusive of 138,000 tons not harvested in 1925, 15,000 tons not harvested in 1926, and 142,000 tons not harvested in 1927.

TABLE 144.—*Grapes: Production by States and districts, 1909, 1919, 1922–1927*

State and district	1909	1919	1922	1923	1924	1925	1926	1927, preliminary
	1,000 short tons	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*
California:								
Central district	492	927	--------	--------	--------	1,472	--------	--------
Northern district	307	338	--------	--------	--------	355	--------	--------
Southern district	59	65	--------	--------	--------	85	--------	--------
Total	858	1,330	1,801	2,030	1,535	1,912	2,114	2,264
Great Lake States:								
New York	127	76	105	62	80	52	107	52
Michigan	60	58	64	44	64	22	61	52
Pennsylvania	17	21	25	16	20	11	25	15
Ohio	22	21	22	19	20	14	29	20
Total	226	176	216	141	184	99	222	139
Central Western States:								
Missouri	9	5	7	6	6	7	13	7
Arkansas	1	1	1	1	3	4	13	3
Illinois	8	5	6	5	5	3	7	3
Iowa	6	6	6	6	5	3	6	5
Kansas	3	3	3	3	3	2	4	4
Total	27	20	23	21	22	19	43	22
All other States	43	35	30	35	37	34	44	40
United States	1,154	1,561	2,076	2,227	1,778	2,064	2,423	2,465

Bureau of Agricultural Economics. Figures for California districts from Bulletin 429, ECONOMIC STATUS OF THE GRAPE INDUSTRY. Calif. Col. Agri., p. 24. Data for 1909 and 1919 from reports of the Bureau of the Census; 1922–1927 estimates by the Bureau of Agricultural Economics on the basis of returns from crop reporters.

TABLE 145.—*Grapes: Estimated commercial production in California, by class, 1899–1927*

Year	Wine	Table	Raisin	Total	Year	Wine	Table	Raisin	Total
	1,000 short tons	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*		*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*
Av. 1910-1914	491	98	304	893	1913	459	95	264	818
					1914	497	132	364	993
1899	236	13	143	392	1915	342	134	512	988
1900	232	12	189	433	1916	507	136	528	1,171
1901	379	14	148	541	1917	441	161	652	1,254
1902	380	15	216	611	1918	343	173	668	1,184
1903	314	27	240	581	1919	400	200	730	1,330
1904	328	22	160	510	1920	375	166	732	1,273
1905	370	24	180	574	1921	310	163	627	1,100
1906	423	31	200	654	1922	450	213	1,043	1,706
1907	462	52	300	814	1923	428	312	1,290	2,030
1908	478	57	260	795	1924	350	325	860	1,535
1909	490	88	280	858	1925	395	339	1,178	1,912
1910	489	74	250	813	1926	414	383	1,317	2,114
1911	549	96	260	905	1927 (prel.)	473	348	1,443	2,264
1912	462	95	380	937					

Bureau of Agricultural Economics. Data for 1899–1921 compiled from Bulletin 429, ECONOMIC STATUS OF THE GRAPE INDUSTRY. Calif. Col. Agr., p. 30. Data for 1922–1927 as reported by the California Cooperative Crop Reporting Service.

Data on raisins are converted to a fresh basis by using 1 ton of dried raisins as the equivalent of 4 tons of fresh fruit. Data from 1920 to date also include raisin grapes consumed in fresh form.

TABLE 146.—*Estimated production of raisins in California, and United States foreign trade in currants and raisins, 1913–1925*

Year	Production of raisins, by variety [1]					United States foreign trade, year beginning July [2]		
	Sultanina (Thompson seedless)	Muscat	Sultana	Other	Total	Imports of currants	Raisins: Imports	Raisins: Domestic exports
	Short tons	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*
1913	9,200	49,300	6,100	1,400	66,000	16,017	2,277	7,383
1914	18,000	60,000	9,000	4,000	91,000	15,175	1,404	12,423
1915	16,300	102,300	7,300	2,100	128,000	12,687	512	37,507
1916	30,500	89,000	7,000	5,500	132,000	5,238	925	25,906
1917	40,500	104,000	10,500	8,000	163,000	2,584	422	27,494
1918	48,800	102,500	11,700	4,000	167,000	421	60	42,075
1919	71,900	91,800	11,700	7,100	182,500	19,113	6,949	43,429
1920	69,500	86,500	12,700	8,300	177,000	25,089	21,634	12,246
1921	69,500	58,900	12,200	4,400	145,000	24,733	9,182	24,820
1922	130,100	84,600	16,900	5,400	237,000	9,462	6,167	46,981
1923	176,900	89,600	21,900	1,600	290,000	8,578	2,872	44,076
1924	110,200	44,200	12,200	3,400	170,000	7,532	5,002	45,391
1925	152,000	28,000	14,000	6,000	200,000	7,386	2,730	67,514
1926 (preliminary)	----------	----------	----------	----------	272,000	6,506	1,985	76,168
1927 (preliminary)	----------	----------	----------	----------	285,000	----------	----------	----------

Bureau of Agricultural Economics.

[1] Compiled from Bulletin 429, ECONOMIC STATUS OF THE GRAPE INDUSTRY. Calif. Col. Agr., p. 101.
[2] Compiled from reports of the Bureau of Foreign and Domestic Commerce.

TABLE 147.—*Grapes: Car-lot shipments, by State of origin, 1920–1927*

State	Crop movement season [1]							
	1920	1921	1922	1923	1924	1925	1926	1927 [2]
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
New York	5,904	2,535	7,720	4,312	5,641	3,763	7,242	2,729
Pennsylvania	1,223	390	1,558	847	1,166	589	1,350	684
Ohio	62	72	80	92	29	19	110	7
Michigan	5,046	1,292	6,020	4,202	4,680	398	3,081	1,977
Iowa	104	77	237	217	79	50	176	165
Missouri	27	4	128	58	101	166	686	111
Washington	8	64	47	62	83	191	125	164
California [3]	28,832	33,344	43,952	55,348	57,695	76,066	64,327	74,444
Other States	104	39	177	198	459	636	1,493	532
Total [3]	41,310	37,817	59,919	65,336	69,933	81,878	78,590	80,813

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis.

[1] Crop movement season extends from June 1 through December of a given year.
[2] Preliminary.
[3] Figures for California include shipments in January of succeeding crop years as follows: 1920, 1 car; 1921, 2 cars; 1922, 7 cars; 1923, 13 cars; 1924, 8 cars; 1925, 21 cars; 1926, 3 cars; 1927, 3 cars.

TABLE 148.—*Grapes: Weighted seasonal averages of auction sales of California grapes in 11 markets* [1]

Variety	Unit	1925 [2]		1926 [3]		1927 [4]	
		Packages	Average	Packages	Average	Packages	Average
		Number	*Dollars*	*Number*	*Dollars*	*Number*	*Dollars*
Alicante	Lug	2,611,316	2.02	3,167,665	1.65	4,475,372	1.59
Carignane	...do	795,954	1.48	774,001	1.47	1,313,496	1.32
Cornichon	Crate	352,940	1.35	229,890	1.27	189,954	1.20
Do	Lug	401,533	1.23	396,823	1.20	386,893	1.15
Emperor	Crate	206,567	1.10	107,263	1.39	67,800	1.11
Do	Lug	239,258	.96	226,732	1.38	169,875	1.16
Malaga	Crate	1,872,808	1.36	1,544,632	1.28	1,214,128	1.28
Do	Lug	2,339,598	1.03	2,193,151	1.11	2,505,039	1.19
Mataro	...do	340,566	1.68	193,939	1.37	299,268	1.30
Mission	...do	1,039,559	1.12	499,424	1.31	530,714	1.06
Muscat	...do	3,117,786	.97	2,429,718	1.02	4,660,233	1.02
Petite Sirah	...do	220,902	1.41	244,309	1.27	316,155	1.35
Sultanina (Thompson Seedless)	Crate	1,537,248	1.31	860,129	1.24	1,081,482	1.42
Do	Lug	2,488,699	1.04	886,437	1.09	1,450,132	1.31
Flame Tokay	Crate	881,027	1.37	726,039	1.50	678,783	1.46
Do	Lug	2,327,784	1.13	1,769,656	1.40	2,107,734	1.38
Zinfandel	...do	1,385,685	1.54	1,017,903	1.22	1,952,972	1.30
Total	Packages	22,159,230		17,283,711		23,401,188	

Bureau of Agricultural Economics. Compiled from daily reports of the fruit and vegetable market news service. Principal varieties only shown.

[1] Baltimore, Boston, Chicago, Cincinnati, Cleveland, Detroit, Minneapolis, New York, Philadelphia, Pittsburgh, and St. Louis.
[2] Aug. 3 to Nov. 14.
[3] Aug. 5 to Nov. 6.
[4] Aug. 2 to Nov. 12.

TABLE 149.—*Grapes, California: Average l. c. l. price per crate, to jobbers, at Kansas City and Pittsburgh, 1925–1927*

Year and month	Malaga		Flame Tokay		Sultanina (Thompson Seedless)	
	Kansas City	Pittsburgh	Kansas City	Pittsburgh	Kansas City	Pittsburgh
1925	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
September	1.54	1.38	1.79	1.56	1.39	1.19
October	1,52	1.43	1.56			
1926						
August	1.31	1.15	1.89		1.35	
September	1.40	1.35	1.54	1.45	1.46	
October		1.35	1.68	1.54		
1927						
September	1.36	1.44	1.69	1.56	1.44	
October	1.39	1.33	1.48	1.36		

Bureau of Agricultural Economics. Compiled from daily market reports from bureau representatives in the various markets.

TABLE 150.—*Grapes: Average l. c. l. price to jobbers, specified markets, 1924–1927*

NEW YORK CONCORD—12-QUART BASKETS

Year	Boston		New York		Philadelphia		Pittsburgh	
	October	November	October	November	October	November	October	November
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1924	91		84		90		85	
1925	102		114		104		109	
1926	61		62	45	56	43	60	44
1927	56		61	68	64	66	64	67

MICHIGAN CONCORD—4-QUART BASKETS

Year	Chicago		Minneapolis		St. I	
	September	October	September	October	September	October
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1924		28				30
1925	38	43	49	46	44	39
1926	21	18		27		22
1927	25	25		30		27

Bureau of Agricultural Economics. Compiled from daily market reports from bureau representatives in the various markets.

Table 151.—*Olive oil (including inedible): International trade, average 1909–1913, annual 1923–1926*

Country	Year ended Dec. 31									
	Average 1909–1913 [1]		1923		1924		1925		1926, preliminary	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
PRINCIPAL EXPORTING COUNTRIES	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Algeria	[2] 974	[2] 11,566	171	24,516	167	28,654	153	25,254	139	27,288
Greece	--------	22,272	77	3,528	165	19,649	[3] 181	[3] 53,480	--------	--------
Italy	[2] 6,643	75,130	1,110	97,628	335	93,730	659	94,901	3,141	51,938
Morocco	267	375	494	2	300	5,633	219	57	279	3,643
Portugal	[2] 2,020	[2] 5,492	4,033	1,678	1,240	2,609	[3] 2,254	[3] 3,957	--------	--------
Spain	30	86,454	1	125,463	1	101,695	3	112,990	9	165,960
Tunis	2,020	18,090	[3] 782	[3] 24,036	4,267	19,638	3,694	37,071	613	49,012
Yugoslavia [3]	--------	--------	1,605	4,565	1,222	1,310	1,614	455	1,012	281
PRINCIPAL IMPORTING COUNTRIES										
Argentina	48,248	--------	[3] 64,399	--------	[3] 64,639	--------	79,705	--------	[3] 91,174	--------
Australia	510	11	[4] 1,034	([4, 5])	[5] 1,223	([4, 5])	[3] 1,246	--------	[3] 1,300	--------
Belgium	[2] 4,295	[2] 582	2,505	123	2,079	35	1,829	51	1,518	37
Brazil	8,409	--------	6,303	1	7,496	([5])	13,298	--------	[3] 11,262	--------
Bulgaria	4,003	7	3,047	([5])	2,096	--------	2,491	--------	1,397	--------
Canada	1,593	--------	2,188	--------	2,528	--------	2,378	--------	3,532	--------
Chile	7,255	--------	10,350	--------	8,733	--------	9,222	--------	[3] 14,590	--------
Cuba	--------	--------	17,647	--------	16,035	--------	17,273	--------	17,319	--------
Czechoslovakia	--------	--------	596	2	801	[3] 37	668	15	624	35
Denmark	146	--------	173	18	135	10	150	6	101	5
Egypt	4,803	--------	3,357	79	3,043	28	3,344	34	2,934	38
France	[3] 42,502	12,935	46,079	12,129	38,459	12,759	41,152	9,905	49,025	11,668
Germany	6,085	--------	937	13	2,060	44	3,362	35	1,837	34
Japan	126	--------	250	--------	227	--------	314	--------	354	--------
Macao (Portuguese China) [3]	--------	--------	5,687	4,234	4,732	4,470	10,275	3,191	5,302	3,437
Netherlands	[2] 282	[2] 205	260	13	174	22	191	8	171	5
New Zealand	68	--------	148	--------	136	--------	150	--------	113	--------
Norway	3,158	33	4,210	--------	9,878	--------	4,722	--------	6,148	--------
Palestine	--------	--------	[3] 3,565	[3] 298	3,126	236	5,039	248	3,627	325
Peru	[2] 684	[2] 77	1,073	--------	901	([5])	1,011	--------	1,238	([5])
Philippine Islands	360	--------	214	--------	276	--------	266	--------	348	--------
Rumania	7,328	--------	2,156	([5])	1,549	1	2,016	([5])	[6] 1,432	[6] 1
Sweden	889	2	465	3	400	([5])	446	3	354	5
Switzerland	4,138	71	3,084	[3] 30	3,295	[3] 36	3,542	([5])	3,355	1
United Kingdom	22,950	823	17,853	367	18,872	302	17,270	291	17,983	325
United States	39,903	--------	117,795	--------	108,104	--------	142,133	--------	128,731	--------
Uruguay	4,249	--------	[7] 8,825	--------	10,640	--------	[6] 12,738	--------	[6] 13,618	--------
Total 35 countries	224,238	234,125	332,173	303,726	319,331	290,898	385,008	341,952	385,481	314,037

Bureau of Agricultural Economics. Official sources except where otherwise noted. Conversions made on the basis of 7.5 pounds to the gallon.

[1] International Institute of Agriculture, Oleaginous Products and Vegetable Oils.
[2] Four-year average.
[3] International Yearbook of Agricultural Statistics.
[4] Year beginning July 1.
[5] Less than 500 pounds.
[6] Nine months.
[7] Eleven months.

TABLE 152.—*Peaches: Number of trees, by States, census years, 1910–1925*

State	1910		1920		1925
	Trees of bearing age	Trees not of bearing age	Trees of bearing age	Trees not of bearing age	Trees of all ages [1]
	Number	*Number*	*Number*	*Number*	*Number*
Maine	5,102	3,320	5,606	2,570	7,222
New Hampshire	57,571	35,213	81,287	23,200	59,373
Vermont	5,492	2,187	2,915	3,978	3,309
Massachusetts	154,592	162,114	346,260	135,426	306,408
Rhode Island	39,342	30,795	61,125	25,366	58,413
Connecticut	461,711	338,608	495,750	133,577	406,915
New York	2,457,187	2,216,907	3,038,023	658,868	3,297,454
New Jersey	1,216,476	1,363,632	1,936,632	884,067	2,425,728
Pennsylvania	2,383,027	2,179,386	3,563,726	1,234,708	3,753,363
Ohio	3,133,368	2,092,300	2,924,177	970,183	3,655,354
Indiana	2,130,298	1,145,479	860,024	568,046	2,046,657
Illinois	2,860,120	739,358	1,011,325	839,712	4,139,100
Michigan	2,907,170	2,991,090	2,010,022	764,838	3,229,145
Wisconsin	4,163	4,148	1,522	1,153	5,036
Minnesota	1,571	3,837	890	427	1,060
Iowa	1,090,749	283,308	129,939	61,043	344,535
Missouri	6,588,034	1,404,429	2,358,925	716,325	2,785,647
North Dakota	90	604	38	32	----------
South Dakota	1,815	5,259	109	177	447
Nebraska	1,188,373	263,882	95,629	40,118	136,493
Kansas	4,394,894	620,709	844,498	278,914	852,976
Delaware	1,177,402	212,117	464,514	93,336	501,111
Maryland	1,497,724	805,063	997,086	285,486	1,042,883
District of Columbia	330	1	1,208	238	247
Virginia	1,585,505	780,551	1,578,253	783,733	2,106,238
West Virginia	1,424,582	1,441,188	2,049,862	651,742	1,788,502
North Carolina	2,661,791	861,042	1,976,756	1,093,903	4,116,566
South Carolina	1,336,142	349,790	871,970	335,599	1,453,161
Georgia	10,609,119	1,531,367	8,655,051	3,391,851	14,969,465
Florida	290,850	156,782	206,155	116,913	290,590
Kentucky	2,245,402	1,110,744	1,671,044	690,483	1,994,033
Tennessee	3,163,737	1,190,727	2,349,656	690,359	3,798,917
Alabama	3,177,331	838,866	1,544,700	546,024	1,849,990
Mississippi	1,726,298	724,895	855,158	493,651	1,070,571
Arkansas	6,859,962	2,884,927	3,342,387	988,966	4,344,322
Louisiana	903,352	316,132	408,178	231,909	413,881
Oklahoma	4,783,825	2,574,680	2,879,945	637,762	2,350,907
Texas	9,737,827	2,958,813	4,461,717	1,640,848	3,758,188
Montana	538	3,386	1,831	420	1,388
Idaho	73,080	212,995	178,434	26,648	147,631
Wyoming	46	419	19	33	147
Colorado	793,372	606,001	446,943	32,158	407,950
New Mexico	136,191	184,466	154,968	36,923	131,973
Arizona	51,415	32,562	101,855	26,681	93,182
Utah	544,314	651,233	554,202	28,551	622,021
Nevada	6,329	5,049	5,940	3,721	10,695
Washington	536,875	1,028,141	649,085	50,254	666,141
Oregon	273,162	508,179	412,936	29,911	348,334
California	7,829,011	4,409,562	9,057,760	1,306,941	13,151,350
United States	94,506,657	42,266,243	65,646,101	21,617,862	89,035,019

Bureau of Agricultural Economics. Compiled from reports of the Bureau of the Census.

[1] Bearing and nonbearing trees not separately reported.

TABLE 153.—*Peaches: Production and value, United States, 1899–1927*

Year	Production	Price per bushel [1]	Total value	Year	Production	Price per bushel [1]	Total value
	1,000 bushels	*Dollars*	*1,000 dollars*		*1,000 bushels*	*Dollars*	*1,000 dollars*
1899	*15, 433*			1915	64, 097		
1900	49, 438			1916	37, 505		
1901	46, 445			1917	48, 765		
1902	37, 831			1918	33, 094	1. 62	53, 637
1903	28, 850			1919	*50, 686*		
1904	41, 070			1919	53, 178	1. 89	100, 485
1905	36, 634			1920	45, 620	2. 10	95, 970
1906	44, 104			1921	32, 602	1. 59	51, 739
1907	22, 527			1922	55, 852	1. 34	74, 717
1908	48, 146			1923	45, 382	1. 37	62, 025
1909	*35, 470*			1924	*47, 755*		
1910	48, 171			1924	53, 848	1. 26	68, 084
1911	34, 880			1925	46, 562	1. 38	64, 171
1912	52, 343			1926	[2] 69, 865	1. 00	68, 426
1913	39, 707			1927 [3]	[2] 45, 463	1. 18	50, 494
1914	54, 109						

Bureau of Agricultural Economics. Production figures are estimates of the crop-reporting board; italic figures are census returns. Prices based upon returns from special price reporters.

[1] From 1918 to 1922, September 15 price; 1923–1925, September 15 price in North, August 15 price in South; 1926 and 1927, approximate average price for the season.
[2] For quantities not harvested in 1926 and 1927, see Table 154.
[3] Preliminary.

TABLE 154.—*Peaches: Production, by States, 1922–1927*

State	1922	1923	1924	1925	1926	1927 [1]	State	1922	1923	1924	1925	1926	1927 [1]
	1,000 bus.	*1,000 bus.*	*1,000 bus.*	*1,000 bus.*	*1,000 bus.*	*1,000 bus.*		*1,000 bus.*	*1,000 bus.*	*1,000 bus.*	*1,000 bus.*	*1,000 bus.*	*1,000 bus.*
N. H.	32	40		34	29	26	Ga.	4, 900	5, 248	8, 342	7, 304	9, 400	5, 943
Mass.	200	205	40	218	213	140	Fla.	130	120	127	115	125	69
R. I.	28	31	29	30	37	23	Ky.	1, 218	450	1, 250	570	1, 110	180
Conn.	262	232	220	210	255	186	Tenn.	2, 002	400	2, 450	1, 415	1, 860	638
N. Y.	3, 400	1, 700	2, 178	1, 920	2, 300	1, 140	Ala.	810	779	1, 230	1, 312	1, 159	540
N. J.	2, 000	2, 642	2, 500	1, 740	3, 000	2, 304	Miss.	375	260	700	712	551	279
Pa.	1, 560	1, 907	1, 715	600	2, 498	947	Ark.	2, 040	1, 110	2, 700	2, 200	2, 400	1, 628
Ohio	1, 584	1, 386	800	1, 100	2, 120	1, 326	La.	180	175	230	275	228	86
Ind.	650	445	240	320	900	242	Okla.	2, 070	1, 032	1, 861	950	180	760
Ill.	1, 100	675	700	500	2, 660	1, 122	Tex.	1, 920	1, 700	1, 900	1, 750	2, 310	800
Mich.	1, 440	1, 125	464	592	1, 564	578	Idaho	244	282	102	23	297	144
Iowa	200	40	3	12	97	65	Colo.	900	750	920	450	976	892
Mo.	2, 300	1, 040	860	870	1, 722	340	N. Mex.	98	189	62	156	131	40
Nebr.	81	45	2	33	50	82	Ariz.	128	70	40	65	91	55
Kans.	630	78	231	371	266	259	Utah	885	802	750	100	550	561
Del.	320	225	400	155	450	287	Nev.	6	5	2	8	8	2
Md.	495	631	600	240	700	352	Wash.	950	1, 333	460	870	1, 222	250
Va.	764	504	1, 500	362	1, 176	400	Oreg.	300	500	189	222	384	160
W. Va.	715	526	1, 000	100	1, 000	202	Calif.	17, 080	15, 830	13, 751	16, 418	22, 542	20, 500
N. C.	1, 010	260	2, 500	1, 500	2, 250	1, 300							
S. C.	845	550	800	740	1, 054	615	U. S.	55, 852	45, 382	53, 848	46, 562	[2] 69, 865	[2] 45, 463

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

[1] Preliminary.
[2] The production of peaches shown for 1926 includes approximately 1,462,000 bushels not harvested in New York, New Jersey, Pennsylvania, Ohio, Michigan, and Georgia because of local market conditions. The California estimate for 1927 includes approximately 2,708,000 bushels not harvested or not utilized.

TABLE 155.—*Peaches; Car-lot shipments by State of origin, 1920–1927*

State and year	Crop movement season [1]						
	May	June	July	August	September	October	Total
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
New York:							
1920	-	-	-	15	3,452	1,168	4,635
1921	-	-	4	1,712	1,233	18	2,967
1922	-	-	3	106	5,953	800	6,862
1923	-	-	-	10	2,166	601	2,777
1924	-	-	-	1	2,312	[2] 1,123	[2] 3,436
1925	-	-	-	38	2,832	185	3,055
1926	-	-	-	-	1,473	[3] 894	[3] 2,367
1927 [4]	-	-	-	2	1,010	138	1,150
New Jersey:							
1920	-	-	27	526	469	-	1,022
1921	-	-	1	4	-	-	5
1922	-	-	234	1,341	20	-	1,595
1923	-	-	85	1,285	420	-	1,790
1924	-	-	21	504	913	23	1,461
1925	-	-	77	909	61	-	1,047
1926	-	-	18	359	768	-	1,145
1927 [4]	-	-	8	367	659	1	1,035
Illinois:							
1920	-	-	5	534	18	-	557
1921	-	-	-	29	6	-	35
1922	-	-	204	1,479	-	-	1,683
1923	-	-	7	338	45	-	390
1924	-	-	9	846	5	-	860
1925	-	1	36	541	1	-	579
1926	-	-	14	2,617	378	1	3,010
1927 [4]	-	-	55	1,517	4	-	1,576
Michigan:							
1920	-	-	-	37	2,175	[5] 146	[5] 2,358
1921	-	-	-	105	71	-	176
1922	-	-	3	850	775	22	1,650
1923	-	-	-	28	1,049	10	1,087
1924	-	-	-	3	55	47	105
1925	-	-	-	14	243	7	264
1926	-	-	-	4	623	48	675
1927 [4]	-	-	-	6	389	-	395
North Carolina:							
1920	-	25	132	221	1	-	379
1921	25	59	506	4	-	-	594
1922	13	85	1,257	97	-	-	1,452
1923	-	19	148	48	-	-	215
1924	-	67	442	1,147	1	-	1,657
1925	8	104	1,295	617	-	-	2,024
1926	-	48	537	1,569	1	-	2,155
1927 [4]	16	88	1,551	22	-	-	1,677
Georgia:							
1920	64	1,807	3,948	166	2	-	5,987
1921	1,286	3,630	5,399	15	-	-	10,330
1922	682	3,003	3,682	3	-	-	7,370
1923	1	2,238	5,898	564	-	-	8,701
1924	25	1,714	10,418	1,331	13	3	13,504
1925	312	4,567	8,475	152	7	-	13,513
1926	39	1,896	12,392	3,634	2	-	17,963
1927 [4]	249	5,279	6,429	6	-	-	11,963
Tennessee:							
1920	-	-	38	116	-	-	154
1921	-	-	214	3	-	-	217
1922	-	1	237	10	-	-	248
1923	-	-	8	45	-	-	53
1924	-	-	2	750	-	-	752
1925	-	-	304	301	-	-	605
1926	-	-	18	1,788	-	-	1,806
1927 [4]	-	-	280	2	-	-	282
Arkansas:							
1920	-	4	31	21	-	-	56
1921	2	9	574	22	-	-	607
1922	-	5	1,306	252	-	-	1,563
1923	-	2	198	524	-	-	724
1924	-	9	319	2,456	1	-	2,785
1925	-	1	2,118	181	-	-	2,300
1926	-	-	1,172	1,357	-	-	2,529
1927 [4]	-	-	2,152	2	-	-	2,154

[1] Crop-movement season extends from May 1 through October of a given year.
[2] Includes 1 car in November.
[3] Includes 5 cars in November.
[4] Preliminary.
[5] Includes 3 cars in November.

TABLE 155.—*Peaches; Car-lot shipments by State of origin, 1920–1927*—Continued

State and year	Crop movement season						
	May	June	July	August	September	October	Total
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
Texas:							
1920			76				76
1921		219	802	3			1,024
1922		5	27				32
1923			47	55			102
1924			456	307			763
1925	2	20	1,031	17			1,070
1926		6	953	5			964
1927 [4]	2		46				48
Colorado:							
1920				62	1,025	4	1,091
1921				559	658	6	1,223
1922				455	965	8	1,428
1923				572	681	1	1,254
1924				484	1,282	6	1,772
1925			3	532	299		834
1926			7	883	380	1	1,271
1927 [4]				830	947	3	1,780
Utah:							
1920					366		366
1921				230	573	2	805
1922				5	1,256		1,261
1923					1,203		1,203
1924		1		264	844		1,109
1925		7	4	56	27		94
1926			2	658	114		774
1927 [4]		1	2	59	729		791
Washington:							
1920			6	26	187	2	221
1921			7	415	689	6	1,117
1922				159	823	8	990
1923			3	802	822	18	1,645
1924			6	341	65		412
1925			18	769	200	4	991
1926			16	1,280	123		1,419
1927 [4]			1	27	215	8	251
California:							
1920	2	210	2,736	3,332	1,601	8	7,889
1921		44	1,970	4,075	1,582	5	7,676
1922		64	138	5,300	3,353	284	9,139
1923		110	4,473	3,875	1,705	49	10,212
1924	3	65	2,720	3,276	1,157	43	7,264
1925		102	4,205	5,194	3,280	4	12,785
1926	13	151	6,147	8,325	2,774	6	17,416
1927 [4]		97	1,674	8,432	4,901	22	15,126
Other States:							
1920		52	203	1,270	1,587	276	3,388
1921	12	44	67	205	223	7	558
1922		26	507	1,871	634	94	3,132
1923		15	96	1,611	1,563	87	3,372
1924		17	206	1,973	1,241	78	3,515
1925	6	149	360	593	470	106	1,684
1926		108	517	2,059	2,211	76	4,971
1927 [4]		33	886	1,757	895	4	3,575
Total:							
1920	66	2,098	7,202	6,326	10,883	[5] 1,604	[5] 28,179
1921	1,325	4,005	9,544	7,381	5,035	44	27,334
1922	695	3,189	7,598	11,928	13,779	1,216	38,405
1923	1	2,384	10,963	9,757	9,654	766	33,525
1924	28	1,873	14,599	13,683	7,889	[2] 1,323	[2] 39,395
1925	328	4,951	17,926	9,914	7,420	306	40,845
1926	52	2,209	21,793	24,538	8,847	[3] 1,026	[3] 58,465
1927 [4]	267	5,498	13,084	13,029	9,749	176	41,803

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis.

[2] Includes 1 cars in November.
[3] Includes 5 cars in November
[4] Preliminary.
[5] Includes 3 cars in November.

TABLE 156.—*Peaches: Average l. c. l. price to jobbers at eight markets*

Market, and season beginning May	6-basket carrier			Bushel basket				
	June [1]	July	August [2]	June [1]	July	August [2]	September	October [2]
New York:	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
1921	3.34	3.04	5.00	-------	2.62	-------	-------	-------
1922	3.05	2.57	2.16	-------	2.29	1.90	1.78	1.43
1923	3.31	2.10	2.03	-------	2.18	2.16	2.48	1.94
1924	2.97	2.25	2.31	-------	1.74	2.18	2.09	2.46
1925	3.43	2.24	2.23	3.38	2.22	2.18	2.74	2.46
1926	3.14	1.79	1.28	3.05	1.74	1.48	1.26	1.17
1927	3.22	2.59	2.65	3.10	2.80	2.94	2.19	2.59
Chicago:								
1921	2.47	2.95	4.23	2.74	3.20	-------	-------	-------
1922	2.72	2.65	-------	2.76	2.51	1.91	1.70	1.38
1923	2.79	2.39	2.56	-------	2.76	3.06	2.11	2.25
1924	1.98	1.88	2.07	1.84	1.86	2.30	2.91	2.17
1925	3.11	2.35	3.01	3.08	2.45	3.16	2.72	2.38
1926	3.02	1.96	1.53	2.44	2.02	1.79	1.76	1.44
1927	2.30	2.32	-------	2.35	2.66	2.81	2.30	-------
Philadelphia:								
1926	3.32	2.01	1.98	-------	1.78	1.92	-------	1.10
1927	2.56	2.36	3.67	-------	2.41	3.72	-------	-------
Pittsburgh:								
1926	-------	1.98	-------	-------	2.19	1.94	1.55	1.21
1927	-------	2.24	-------	-------	2.71	3.09	2.04	2.38
St. Louis:								
1926	2.38	1.95	-------	3.41	2.09	1.82	2.10	1.78
1927	2.16	-------	-------	2.05	2.50	3.28	2.72	2.56
Cincinnati:								
1926	2.74	-------	-------	2.47	1.82	1.71	1.70	1.41
1927	1.93	-------	-------	2.46	2.39	3.33	2.40	2.28
Kansas City:								
1926	-------	2.28	-------	-------	2.12	2.10	2.22	2.01
1927	-------	-------	-------	-------	2.52	3.43	2.58	-------
Washington:								
1926	-------	2.06	1.72	-------	2.18	1.80	1.67	1.63
1927	2.68	2.33	2.74	3.36	2.56	2.51	2.10	2.52

Bureau of Agricultural Economics. Compiled from daily market reports from bureau representatives in the various markets.

Average prices as shown are based on stock of good merchantable quality and condition; they are simple averages of daily range of selling prices.

Earlier data for cities showing prices for 1926 and 1927 only are available in 1925 Yearbook, p. 882, Table 206.

[1] Quotations began June 3, 1921, May 25, 1922, June 5, 1923, June 3, 1924, June 1, 1925, June 7, 1926, June 11, 1927.

[2] Last reported quotations of season Aug. 9, 1921, Oct. 11, 1922; Oct. 13, 1923 and 1924, Oct. 3, 1925, Oct. 21, 1926, Oct. 12, 1927.

TABLE 157.—*Pears: Production and value, United States, 1899, 1909–1927*

Year	Production	Price per bushel [1]	Total value	Year	Production	Price per bushel [1]	Total value
	1,000 bushels	*Dollars*	*1,000 dollars*		*1,000 bushels*	*Dollars*	*1,000 dollars*
1899	*6,625*	-------	-------	1919	*14,204*	-------	-------
1909	*8,841*	-------	-------	1919	15,006	1.84	27,614
1910	10,431	-------	-------	1920	16,805	1.66	27,865
1911	11,450	-------	-------	1921	11,297	1.71	19,268
1912	11,843	-------	-------	1922	20,705	1.06	21,943
1913	10,108	-------	-------	1923	17,845	1.21	21,570
1914	12,086	-------	-------	1924	18,866	1.42	26,689
1915	11,216	-------	-------	1925	20,720	1.40	29,066
1916	11,874	-------	-------	1926	25,249	.89	22,399
1917	13,281	-------	-------	1927 [2]	18,072	1.32	23,902
1918	13,362	1.38	18,419				

Bureau of Agricultural Economics. Production figures are estimates of the crop-reporting board; italic figures are census returns. Prices are based upon returns from special price reporters.

[1] From 1918 to 1925, Nov. 15 price; 1926 and 1927, approximate average price for the season.

[2] Preliminary.

TABLE 158.—*Pears: Number of trees, by States, census years, 1910–1925*

State	1910		1920		1925
	Trees of bearing age	Trees not of bearing age	Trees of bearing age	Trees not of bearing age	Trees of all ages [1]
	Number	*Number*	*Number*	*Number*	*Number*
Maine	46,683	13,013	22,525	7,120	31,681
New Hampshire	36,816	9,397	21,506	7,753	25,996
Vermont	26,315	7,726	14,352	8,484	16,319
Massachusetts	113,365	38,378	88,630	52,745	131,361
Rhode Island	16,007	5,405	13,435	7,955	18,659
Connecticut	56,788	23,731	59,985	31,867	90,658
New York	2,141,596	1,502,661	2,778,761	967,573	3,331,601
New Jersey	731,616	238,401	480,601	77,026	431,799
Pennsylvania	796,882	382,180	753,632	237,043	855,634
Ohio	899,019	333,739	616,416	147,892	687,771
Indiana	708,723	229,548	337,515	68,150	388,394
Illinois	786,349	234,037	435,707	148,810	771,671
Michigan	1,136,151	623,931	1,029,735	302,734	1,249,246
Wisconsin	29,841	20,250	23,637	8,531	37,231
Minnesota	2,792	4,135	1,626	882	1,873
Iowa	191,125	123,262	100,582	34,985	147,277
Missouri	606,973	272,213	376,208	101,994	480,878
North Dakota	24	327	486	148	363
South Dakota	1,844	5,087	711	2,044	1,544
Nebraska	59,285	51,443	36,926	29,011	67,240
Kansas	292,383	132,673	207,854	79,957	257,451
Delaware	449,692	90,917	249,375	26,575	205,501
Maryland	540,583	138,152	305,510	48,918	285,981
District of Columbia	1,045	32	517	152	429
Virginia	457,177	255,083	311,199	79,561	404,800
West Virginia	154,908	102,826	116,685	43,357	141,754
North Carolina	243,367	150,368	219,725	129,104	287,863
South Carolina	105,251	54,732	78,999	33,188	100,747
Georgia	262,982	69,534	178,070	83,474	246,898
Florida	110,709	18,817	46,199	20,574	92,921
Kentucky	337,355	131,905	238,007	76,505	255,150
Tennessee	233,407	174,675	223,556	73,679	273,359
Alabama	142,300	99,170	115,082	51,411	217,726
Mississippi	118,556	101,209	75,179	51,094	157,575
Arkansas	221,764	196,753	145,789	49,412	176,684
Louisiana	57,630	38,242	38,796	27,336	62,911
Oklahoma	207,271	252,336	229,468	73,941	223,763
Texas	558,478	448,809	435,684	182,394	468,828
Montana	10,297	12,808	10,278	1,386	4,263
Idaho	65,113	76,939	75,452	20,539	71,177
Wyoming	178	901	116	239	206
Colorado	99,989	171,367	136,117	39,979	186,244
New Mexico	37,220	100,201	49,315	19,423	38,846
Arizona	16,351	12,852	12,359	7,716	16,740
Utah	79,355	39,901	51,812	8,479	59,903
Nevada	3,946	2,215	3,569	4,109	5,874
Washington	290,676	617,754	806,034	183,346	1,476,093
Oregon	273,452	795,669	727,444	214,523	1,314,131
California	1,410,905	398,093	2,305,646	2,178,526	7,397,456
United States	15,171,524	8,803,885	14,047,412	6,052,247	23,198,479

Bureau of Agricultural Economics. Compiled from reports of the Bureau of the Census.

[1] Bearing and nonbearing trees not separately reported.

TABLE 159.—*Pears: Production, by States, 1922–1927*

State	1922	1923	1924	1925	1926	1927 [1]	State	1922	1923	1924	1925	1926	1927 [1]
	1,000 bus.	*1,000 bus.*	*1,000 bus.*	*1,000 bus.*	*1,000 bus.*	*1,000 bus.*		*1,000 bus.*	*1,000 bus.*	*1,000 bus.*	*1,000 bus.*	*1,000 bus.*	*1,000 bus.*
Me	14	7	12	13	6	13	S. C	104	88	114	87	133	68
N. H	24	12	17	19	10	14	Ga	202	192	232	155	257	104
Vt	10	6	12	12	6	12	Fla	50	35	55	54	66	44
Mass	84	58	84	90	60	81	Ky	150	70	117	85	144	34
R. I	12	10	12	13	12	12	Tenn	180	83	250	148	266	125
Conn	60	37	62	60	57	54	Ala	176	174	224	157	211	83
N. Y	3,200	1,000	2,100	3,045	2,088	1,872	Miss	190	90	187	189	189	120
N. J	405	662	624	512	645	420	Ark	100	45	124	89	116	70
Pa	576	612	629	468	748	400	La	48	45	65	74	71	50
Ohio	450	332	326	354	430	250	Okla	197	100	235	146	81	130
Ind	300	334	180	209	328	140	Tex	390	340	483	386	580	345
Ill	510	307	500	540	818	312	Mont	8	8	------	------	------	------
Mich	1,500	1,005	810	450	889	702	Idaho	72	72	60	39	68	56
Wis	19	16	15	15	------	------	Colo	519	400	550	510	564	480
Iowa	75	62	40	45	68	41	N. Mex	18	49	28	56	42	28
Mo	450	475	375	342	473	270	Ariz	18	18	11	14	15	12
Nebr	27	24	30	18	29	36	Utah	98	64	70	25	80	60
Kans	243	134	262	165	186	258	Nev	4	7	4	7	6	2
Del	158	370	328	180	388	128	Wash	1,740	2,700	1,750	2,300	3,220	1,578
Md	256	374	335	280	394	193	Oreg	1,400	1,580	1,225	1,500	2,100	1,900
Va	270	200	430	135	410	130	Calif	6,250	5,542	5,542	7,542	8,625	7,333
W. Va	38	41	84	34	100	12							
N. C	110	65	273	158	270	100	U. S	20,705	17,845	18,866	20,720	25,249	18,072

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

[1] Preliminary.

TABLE 160.—*Pears: Car-lot shipments, by State of origin, 1920–1926*

State	Crop movement season [1]						
	1920	1921	1922	1923	1924	1925	1926 [2]
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
New York	3,979	2,893	5,461	1,701	2,978	4,510	2,263
New Jersey	74	23	40	76	60	52	47
Ohio	64	17	96	33	47	62	100
Indiana	71	----------	44	39	61	59	44
Illinois	1,179	33	468	318	595	614	858
Michigan	1,264	653	1,860	543	394	151	457
Delaware	290	----------	151	541	273	128	249
Maryland	54	3	36	63	30	29	33
Texas	98	115	50	99	129	121	144
Colorado	654	745	774	696	955	717	750
Utah	88	33	82	65	81	29	77
Washington	1,902	2,903	2,678	4,274	2,456	3,560	5,278
Oregon	1,006	985	1,862	2,575	1,483	2,225	2,900
California	5,016	4,500	6,465	7,143	6,312	8,718	11,673
Other States	202	150	314	423	392	282	327
Total	15,941	13,053	20,381	18,589	16,246	21,257	25,209

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis.

[1] Crop movement season extends from June 1 of one year through May of the following year.
[2] Preliminary.

TABLE 161.—*Pears: Estimated price per bushel received by producers, United States, 1910–1927*

Year	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Weighted average	Year	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Weighted average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*		*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1910	-------	100.9	98.6	100.8	122.4	100.9	1919	188.4	183.0	181.3	182.0	219.5	185.7
1911	118.0	103.8	97.2	85.1	111.0	109.4	1920	195.5	197.9	184.2	170.1	164.5	194.1
1912	106.3	100.0	83.1	79.3	92.8	100.4	1921	165.2	175.1	186.4	194.9	198.7	172.2
1913	109.9	119.3	95.6	93.0	97.9	111.2	1922	147.1	-------	116.2	119.8	118.7	139.7
1914	98.8	92.8	80.4	77.5	82.5	93.7	1923	168.3	172.5	165.1	150.2	133.0	165.5
1915	80.8	83.8	82.7	89.8	89.7	82.5	1924	175.2	157.8	155.0	141.0	-------	165.4
1916	109.0	102.7	96.9	93.3	105.6	104.8	1925	172.6	165.2	164.2	149.7	162.6	168.2
1917	132.2	125.0	118.2	116.1	-------	127.4	1926	137.5	119.2	117.2	105.6	97.1	127.0
1918	168.4	157.8	147.5	140.1	156.6	161.1	1927	141.3	140.5	150.9	156.6	163.1	142.7

Bureau of Agricultural Economics. Based upon returns from special price reporters.

TABLE 162.—*Strawberries, commercial crop: Acreage, production, and price per quart, by States, 1924–1927*

State	Acreage				Production				Price per quart [1]			
	1924	1925	1926	1927	1924	1925	1926	1927	1924	1925	1926	1927
	Acres	*Acres*	*Acres*	*Acres*	*1,000 quarts*	*1,000 quarts*	*1,000 quarts*	*1,000 quarts*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Early.												
Alabama	3, 960	3, 440	3, 620	4, 520	5, 544	5, 504	5, 140	7, 924	0. 13	0. 16	0. 18	0. 15
Florida	4, 690	4, 240	2, 980	3, 680	8, 676	8, 056	5, 513	6, 900	. 27	. 26	. 35	. 29
Louisiana	14, 600	10, 340	18, 500	21, 100	17, 885	10, 340	24, 975	16, 711	. 27	. 33	. 29	. 23
Mississippi	1, 190	1, 160	920	840	1, 428	1, 276	1, 104	1, 344	. 18	. 19	. 27	. 20
Texas	1, 070	980	720	1, 020	1, 284	1, 078	1, 056	1, 781	. 18	. 18	. 29	. 18
Second Early:												
Arkansas	20, 780	14, 940	14, 140	17, 590	31, 170	12, 908	22, 058	20, 651	. 14	. 16	. 19	. 11
California, Southern District	1, 970	1, 150	820	1, 620	12, 805	5, 060	3, 317	8, 664	. 12	. 19	. 18	. 24
North Carolina	6, 190	5, 130	5, 080	5, 800	16, 713	12, 312	10, 907	16, 657	. 13	. 14	. 16	. 16
South Carolina	540	430	300	300	1, 210	1, 032	600	528	. 11	. 15	. 16	. 15
Tennessee	26, 220	18, 780	13, 730	14, 960	35, 240	22, 536	17, 162	26, 479	. 13	. 14	. 18	. 11
Virginia	11, 360	8, 600	8, 000	9, 420	23, 856	24, 080	19, 360	22, 796	. 14	. 13	. 15	. 14
Intermediate:												
California, other	1, 770	2, 020	2, 090	2, 130	5, 499	10, 100	8, 747	9, 419	. 17	. 23	. 20	. 22
Delaware	4, 900	2, 600	3, 200	4, 000	11, 760	4, 160	6, 656	9, 600	. 09	. 15	. 13	. 11
Illinois	3, 590	3, 330	3, 060	4, 280	7, 180	4, 662	3, 461	3, 595	. 11	. 17	. 12	. 12
Indiana	2, 020	1, 540	1, 650	1, 650	4, 040	1, 848	3, 135	2, 053	. 12	. 17	. 13	. 14
Iowa	2, 960	2, 760	2, 850	2, 560	5, 032	3, 588	3, 819	4, 915	. 14	. 20	. 12	. 18
Kansas	920	950	960	960	2, 024	1, 140	1, 435	2, 304	. 10	. 18	. 17	. 15
Kentucky	4, 370	4, 260	4, 790	6, 740	5, 454	3, 408	8, 167	10, 932	. 15	. 19	. 13	. 19
Maryland	11, 080	9, 100	10, 650	12, 780	24, 376	17, 290	34, 080	28, 666	. 09	. 16	. 15	. 12
Missouri	11, 420	11, 960	15, 170	27, 340	18, 272	25, 116	22, 027	26, 082	. 14	. 19	. 12	. 15
New Jersey	6, 500	5, 500	5, 500	6, 600	14, 560	5, 280	10, 560	14, 784	. 11	. 14	. 15	. 12
Late:												
Michigan	7, 790	6, 450	6, 230	6, 480	15, 580	3, 225	9, 569	12, 843	. 12	. 18	. 13	. 15
New York	4, 900	4, 400	4, 570	4, 570	10, 290	13, 640	11, 361	13, 308	. 13	. 18	. 19	. 18
Ohio	3, 800	3, 700	3, 600	3, 780	7, 600	3, 330	9, 000	5, 795	. 13	. 24	. 16	. 16
Oregon	6, 020	5, 930	7, 320	8, 420	9, 632	13, 046	12, 766	23, 231	. 15	. 12	. 11	. 08
Pennsylvania	3, 250	3, 100	3, 100	3, 260	5, 200	3, 720	4, 650	6, 650	. 18	. 21	. 18	. 15
Utah	950	1, 000	1, 000	1, 300	1, 615	1, 400	2, 400	2, 544	. 14	. 19	. 16	. 12
Washington	5, 620	5, 430	6, 090	7, 670	10, 116	7, 602	11, 327	29, 829	. 13	. 20	. 16	. 12
Wisconsin	2, 040	1, 840	1, 840	2, 760	4, 080	1, 840	3, 588	5, 299	. 10	. 18	. 18	. 15
Total	176, 470	145, 060	152, 480	188, 130	318, 121	228, 577	277, 940	342, 284	. 14	. 18	. 17	. 15

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

[1] Average for season.

TABLE 163.—*Strawberries: Car-lot shipments by State of origin, 1920–1927*

State	1920	1921	1922	1923	1924	1925	1926	1927 [1]
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
New York	257	243	325	301	345	200	238	180
New Jersey	303	363	274	187	402	126	207	134
Illinois	112	73	260	224	367	295	247	176
Michigan	446	454	640	408	554	39	155	114
Missouri	245	451	1, 963	872	990	1, 497	1, 435	1, 986
Delaware	652	866	940	924	1, 307	472	671	915
Maryland	793	1, 132	1, 634	1, 916	2, 155	1, 092	1, 394	1, 515
Virginia	270	679	1, 691	1, 193	1, 910	1, 249	1, 136	1, 104
North Carolina	363	503	1, 101	1, 668	2, 046	1, 634	1, 253	2, 202
Florida [2]	182	150	322	1, 035	580	678	251	619
Kentucky	265	395	772	827	467	312	581	976
Tennessee	1, 150	1, 839	3, 634	3, 279	2, 902	1, 637	1, 253	2, 425
Alabama	139	285	460	693	408	421	440	901
Arkansas	650	1, 087	2, 165	1, 342	1, 613	993	1, 375	2, 041
Louisiana	626	1, 525	1, 576	1, 678	1, 865	1, 076	2, 342	1, 658
California	258	292	201	226	191	130	104	178
Other States	428	528	803	1, 028	855	405	446	748
Total	7, 199	10, 865	18, 761	17, 801	18, 966	12, 256	13, 528	17, 881

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis.

[1] Preliminary.

[2] Figures for Florida include shipments in December of preceding year as follows: 1921, 8 cars; 1924, 3 cars; 1925, 10 cars; 1927, 2 cars.

TABLE 164.—*Strawberries: Average l. c. l. price per quart to jobbers at nine markets, 1921–1927*

Market, and season beginning March	Mar.[1]	Apr.	May	June [2]
	Cents	*Cents*	*Cents*	*Cents*
New York:				
1921	47	41	27	20
1922	60	37	21	16
1923	65	43	20	18
1924	-------	41	20	13
1925	42	37	21	23
1926	-------	51	26	21
1927	40	37	18	17
Chicago:				
1921	31	37	24	14
1922	45	29	14	12
1923	45	41	20	15
1924	-------	46	22	17
1925	50	43	21	25
1926	-------	42	27	17
1927	37	32	16	19
Philadelphia:				
1921	33	34	23	13
1922	53	32	18	17
1923	55	40	18	15
1924	-------	41	19	10
1925	39	34	17	16
1926	-------	44	23	16
1927	38	31	16	-------
Pittsburgh:				
1921	34	34	26	20
1922	50	34	17	18
1923	62	41	22	16
1924	-------	49	24	16
1925	46	45	23	28
1926	-------	44	28	20
1927	41	35	18	18
St. Louis:				
1921	31	33	23	14
1922	54	26	14	16
1923	49	40	18	-------
1924	-------	44	20	11
1925	45	37	18	-------
1926	-------	41	25	-------
1927	38	35	15	-------
Cincinnati:				
1921	33	27	23	-------
1922	53	18	12	-------
1923	48	30	15	10
1924	-------	40	17	15
1925	38	27	17	-------
1926	-------	38	24	15
1927	31	22	12	-------
Minneapolis:				
1921	37	41	31	24
1922	-------	29	18	14
1923	58	45	26	19
1924	-------	45	27	19
1925	51	48	24	30
1926	-------	42	31	18
1927	45	39	20	27
Kansas City:				
1921	33	36	23	20
1922	-------	31	16	13
1923	46	40	21	16
1924	-------	40	22	15
1925	46	42	21	-------
1926	-------	39	29	18
1927	34	34	17	-------
Washington:				
1924	-------	31	17	12
1925	-------	27	15	-------
1926	-------	44	23	-------
1927	40	24	16	14

Bureau of Agricultural Economics. Compiled from daily market reports from bureau representatives in the various markets.

Average prices as shown are based on stock of good merchantable quality and condition; they are simple averages of daily range of selling prices. In some cases conversions have been made from larger to smaller units or vice versa in order to obtain comparability.

[1] Quotations began Mar. 17, 1921; Mar. 23, 1922; Mar. 28, 1923; Mar. 31, 1924; Mar. 19, 1925; Mar. 29, 1926; Mar. 7, 1927.

[2] Last reported quotations of season June 3, 1921; June 6, 1922; June 13, 1923; June 17, 1924; June 9, 1925; June 19, 1926; June 20, 1927.

TABLE 165.—*Miscellaneous fruits and nuts: Production, 1926 and 1927*

Crop	Production 1926	Production 1927	Crop	Production 1926	Production 1927
Pineapples:	*1,000 boxes*	*1,000 boxes*	Prunes, dried:	*Tons*	*Tons*
Florida	22	13	California	150,000	190,000
Limes:			Oregon	34,000	15,000
Florida	12	0	Washington	6,500	3,000
Cherries:[1]	*Tons*	*Tons*	Prunes, marketed fresh:[2]		
Wisconsin	715	225	Idaho	20,000	22,000
Montana	390	312	Oregon	17,000	17,000
Utah	5,300	3,600	Walnuts ("English"):		
Oregon	14,000	10,500	California	15,000	42,000
California	20,000	12,000	Oregon	900	800

Bureau of Agricultural Economics.

[1] Incomplete. Estimates for some States are not available.

[2] California prunes shipped fresh included with plums. See Table 166.

TABLE 166.—*Fruits and nuts: Production and value in California, 1919–1927*

Crop and year	Production	Farm value, Dec. 1	
		Per unit	Total
			1,000 dollars
Apricots:[1]	*Tons*	*Dollars*	
1919	175, 000	80. 00	14, 000
1920	110, 000	85. 00	9, 350
1921	100, 000	50. 00	5, 000
1922	145, 000	70. 00	10, 150
1923	210, 000	25. 00	5, 250
1924	142, 000	46. 00	6, 532
1925	150, 000	54. 00	8, 100
1926	176, 000	63. 00	11, 088
1927	184, 000	57. 00	10, 488
Prunes:[2]			
1919	135, 000	240. 00	32, 400
1920	97, 250	130. 00	12, 643
1921	100, 000	130. 00	13, 000
1922	110, 000	140. 00	15, 400
1923	130, 000	100. 00	13, 000
1924	139, 000	110. 00	15, 290
1925	146, 000	110. 00	16, 060
1926	150, 000	100. 00	15, 000
1927	190, 000	70. 00	13, 300
Plums:[1 3]			
1919	42, 000	60. 00	2, 520
1920	35, 000	90. 00	3, 150
1921	42, 000	53. 00	2, 226
1922	48, 000	50. 00	2, 400
1923	69, 000	30. 00	2, 070
1924	39, 000	45. 00	1, 755
1925	51, 000	40. 00	2, 040
1926	71, 000	25. 00	1, 775
1927	57, 000	45. 00	2, 565
Cherries:			
1919	12, 400	150. 00	1, 860
1920	17, 500	200. 00	3, 500
1921	13, 000	125. 00	1, 625
1922	14, 000	180. 00	2, 520
1923	17, 000	160. 00	2, 720
1924	13, 500	140. 00	1, 890
1925	12, 000	160. 00	1, 920
1926	20, 000	180. 00	3, 600
1927	12, 000	180. 00	2, 160
Grapes (All):			
1923	2, 030, 000	26. 00	52, 780
1924	1, 535, 000	35. 00	53, 725
1925	[4] 1, 912, 000	28. 00	53, 536
1926	[4] 2, 114, 000	25. 00	52, 850
1927	[4] 2, 264, 000	25. 00	56, 600
Raisins:[5]			
1919	182, 500	210. 00	38, 325
1920	177, 000	235. 00	41, 595
1921	145, 000	190. 00	27, 550
1922	237, 000	105. 00	24, 885
1923	290, 000	45. 00	13, 050
1924	170, 000	70. 00	11, 900
1925	200, 000	80. 00	16, 000
1926	272, 000	70. 00	19, 040
1927	285, 000	70. 00	19, 950

Crop and year	Production	Farm value, Dec. 1	
		Per unit	Total
Grapes (raisin varieties marketed fresh):[6]	*Tons*	*Dollars*	*1,000 dollars*
1923	130, 000	20. 00	2, 600
1924	180, 000	20. 00	3, 600
1925	378, 000	20. 00	7, 560
1926	229, 000	20. 00	4, 580
1927	303, 000	23. 00	6, 969
Grapes (table):			
1919	200, 000	75. 00	15, 000
1920	166, 000	75. 00	12, 450
1921	163, 000	80. 00	13, 040
1922	213, 000	60. 00	12, 780
1923	312, 000	40. 00	12, 480
1924	325, 000	40. 00	13, 000
1925	339, 000	20. 00	6, 780
1926	383, 000	25. 00	9, 575
1927	348, 000	26. 00	9, 048
Grapes (juice):			
1919	400, 000	50. 00	20, 000
1920	375, 000	75. 00	28, 125
1921	310, 000	82. 00	25, 420
1922	450, 000	65. 00	29, 250
1923	428, 000	40. 00	17, 120
1924	350, 000	63. 00	22, 050
1925	395, 000	60. 00	23, 700
1926	414, 000	45. 00	18, 630
1927	473, 000	45. 00	21, 285
Oranges:[7]	*Boxes*		
1919	15, 265, 000	2. 75	[8] 42, 702
1920	21, 296, 000	2. 18	[8] 47, 088
1921	12, 640, 000	2. 80	[8] 36, 400
1922	20, 106, 000	2. 00	[8] 41, 000
1923	24, 137, 000	2. 00	[8] 49, 000
1924	18, 100, 000	3. 55	[8] 65, 629
1925	24, 200, 000	2. 84	[8] 70, 432
1926	28, 167, 000	3. 07	86, 473
1927	22, 540, 000	3. 00	67, 620
Grapefruit:			
1919	263, 000		
1920	304, 000		
1921	360, 000		
1922	394, 000		
1923	363, 000		
1924	387, 000		
1925	600, 000		
1926	650, 000	2. 35	1, 528
1927	720, 000	2. 50	1, 800
Lemons:[7]			
1919	3, 499, 000	2. 00	6, 998
1920	4, 955, 000	2. 92	14, 469
1921	4, 050, 000	3. 45	13, 973
1922	3, 400, 000	3. 30	11, 220
1923	6, 732, 000	1. 60	10, 771
1924	5, 125, 000	3. 48	17, 835
1925	7, 136, 000	2. 11	15, 057

1 To calculate the production of apricots and plums in bushels, multiply the production in tons by 2,000 (the number of pounds in a ton) and divide by 48, the usual number of pounds in a bushel.
2 Dried basis. To calculate in terms of fresh fruit multiply the quantity of dried prunes produced by 2½.
3 The production shown includes a small quantity of prune varieties shipped fresh, but does not include prunes dried.
4 The totals shown for California are exclusive of 138,000 tons not harvested in 1925, 15,000 tons not harvested in 1926, and 142,000 tons not harvested in 1927.
5 Dried basis. To calculate the approximate quantity of fresh grapes used for raisins multiply the production of raisins by 4.
6 For years prior to 1923 the quantity of raisins marketed fresh was small and has been included with other table grapes.
7 Representing the commercial crop year beginning Nov. 1 of the year shown; the numbers for 1927, for instance, represent the fruit that set during the season of 1927 and will be picked and marketed from Nov. 1, 1927, to Oct. 31, 1928.
8 Includes value of grapefruit.

TABLE 166.—*Fruits and nuts: Production and value in California, 1919–1927*—Continued

Crop and year	Production	Farm value, Dec. 1		Crop and year	Production	Farm value, Dec. 1	
		Per unit	Total			Per unit	Total
Lemons—Con.	*Tons*	*Dollars*	*1,000 dollars*	Almonds:	*Tons*	*Dollars*	*1,000 dollars*
1926	7,712,000	2.81	21,671	1919	7,250	440.00	3,190
1927	6,400,000	2.75	17,600	1920	5,500	360.00	1,980
Figs:	*Tons*			1921	6,000	320.00	1,920
1919	12,000	150.00	1,800	1922	8,500	290.00	2,465
1920	12,300	90.00	1,107	1923	11,000	260.00	2,860
1921	9,600	145.00	1,392	1924	8,000	300.00	2,400
1922	11,000	120.00	1,320	1925	7,500	400.00	3,000
1923	9,500	90.00	855	1926	16,000	300.00	4,800
1924	8,500	100.00	850	1927	12,000	320.00	3,840
1925	9,600	110.00	1,056	Walnuts, "English":			
1926	11,400	95.00	1,083				
1927	7,000	55.00	385	1919	28,100	550.00	15,455
Olives:				1920	21,000	400.00	8,400
1919	8,800	160.00	1,408	1921	19,500	400.00	7,800
1920	8,000	95.00	760	1922	27,000	360.00	9,720
1921	8,200	90.00	738	1923	25,000	400.00	10,000
1922	10,000	125.00	1,250	1924	22,500	460.00	10,350
1923	17,000	65.00	1,105	1925	36,000	440.00	15,840
1924	6,500	92.00	598	1926	15,000	480.00	7,200
1925	14,000	60.00	840	1927	42,000	360.00	15,120
1926	12,000	80.00	960				
1927	15,000	80.00	1,200				

Bureau of Agricultural Economics; California estimates in cooperation with California Department of Agriculture; 1927 estimates are preliminary.

TABLE 167.—*Pecans: Estimated production and value, by States, 1924–1927*

State	Production				Proportions (approximate)									
					Im-proved	Seed-lings	Improved				Seedling			
	1924	1925	1926	1927			1924	1925	1926	1927	1924	1925	1926	1927
	1,000 lbs.	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*Per cent*	*Per cent*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
Illinois	155	23	280	70	1	99	2	----------	3	1	153	23	277	69
Missouri	330	436	800	180	1	99	3	4	8	2	327	432	792	178
North Carolina	300	135	450	400	55	45	165	74	248	220	135	61	202	180
South Carolina	700	450	850	606	60	40	420	270	510	364	280	180	340	242
Georgia	1,250	5,550	6,732	3,094	78	22	975	4,329	5,251	2,413	275	1,221	1,481	681
Florida	910	1,340	1,060	800	50	50	455	670	530	400	455	670	530	400
Alabama	897	1,173	1,839	856	65	35	583	762	1,195	556	314	411	644	300
Mississippi	1,932	5,094	5,200	3.200	(1)	(1)	889	1,783	1,508	1,120	1,043	3,311	3,692	2,080
Arkansas	1,000	2,100	3,000	1,500	5	95	50	105	150	75	950	1,995	2.850	1,425
Louisiana	725	1,825	1,825	875	15	85	109	274	274	131	616	1,551	1,551	744
Oklahoma	5,612	6,804	10,010	4,550	1	99	56	68	100	46	5,556	6,736	9,910	4,504
Texas	6,100	4,500	32,000	6,000	1	99	61	45	320	60	6,039	4,455	31,680	5,940
United States	19,911	29,450	64,046	22,131	[2] 24.3	[2] 75.7	3,768	8,384	10,097	5,388	16,143	21,046	53,949	16,743

[1] Proportions for Mississippi, as follows: 1924—improved, 46 per cent; seedling, 54 per cent. 1925—improved, 35 per cent; seedling, 65 per cent. 1926—improved ,29 per cent; seedling, 71 per cent. 1927—improved, 35 per cent; seedling, 65 per cent.
[2] Proportions for 1927 only.

TABLE 167.—*Pecans: Estimated production and value, by States, 1924–1927*—Continued

State	Prices								Value							
	Improved				Seedling				Improved				Seedling			
	1924	1925	1926	1927	1924	1925	1926	1927	1924	1925	1926	1927	1924	1925	1926	1927
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*
Illinois	40	35	32	35	18	17	17	14	1	------	1	------	28	4	47	10
Missouri	40	35	32	48	25	18	16	20	1	1	3	1	82	78	127	36
North Carolina	42	45	44	40	27	30	25	27	69	33	109	88	36	18	50	49
South Carolina	41	45	28	35	25	30	21	23	172	122	143	127	70	54	71	56
Georgia	45	37	31	34	22	25	15	17	439	1,602	1,628	820	60	305	222	116
Florida	43	37	30	33	22	22	14	17	196	248	159	132	100	147	74	68
Alabama	44	40	34	37	24	25	19	20	257	305	406	206	75	103	122	60
Mississippi	44	39	37	38	25	23	18	19	391	695	558	426	261	762	665	395
Arkansas	40	34	35	35	25	18	15	15	20	36	52	26	238	359	428	214
Louisiana	42	32	32	38	23	17	14	16	46	88	88	50	142	264	217	119
Oklahoma	40	35	30	35	16	15	10	13	22	24	30	16	889	1,010	991	586
Texas	45	34	30	35	17	17	11	16	27	15	96	21	1,027	757	3,485	950
United States	43.6	37.8	32.4	35.5	18.6	18.3	12.0	15.9	1,641	3,169	3,273	1,913	3,008	3,861	6,499	2,659

Bureau of Agricultural Economics. Based upon inquiries and investigations of field agricultural statisticians.

TABLE 168.—*Asparagus for consumption fresh, commercial crop: Acreage, production, and price per crate, by States, 1924–1927*

State	Acreage				Production				Price per crate [1]			
	1924	1925	1926	1927	1924	1925	1926	1927	1924	1925	1926	1927
	Acres	*Acres*	*Acres*	*Acres*	*1,000 crates*[2]	*1,000 crates*[2]	*1,000 crates*[2]	*1,000 crates*[2]	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Early:												
California	3,490	6,600	9,980	10,080	632	1,115	1,856	1,341	2.46	2.05	3.26	2.90
Georgia	2,660	2,820	4,380	4,900	32	54	70	118	3.79	3.70	3.42	3.82
South Carolina	3,500	4,500	5,300	6,400	105	166	307	320	4.27	3.46	3.08	4.01
Late:												
Delaware	1,000	1,200	1,500	1,500	70	58	90	81	3.88	3.24	3.00	2.70
Illinois	2,640	2,700	3,050	3,360	211	224	201	286	2.30	1.90	1.66	1.50
Iowa	140	140	150	150	10	9	9	11	1.92	1.70	1.65	2.00
Maryland	1,200	1,600	1,920	2,120	84	115	121	208	3.52	3.19	2.00	3.44
Michigan	280	320	390	480	15	24	26	38	2.74	2.55	2.90	2.74
New Jersey	8,000	9,000	10,000	10,500	528	648	740	882	3.02	3.25	3.05	2.80
Pennsylvania	800	1,000	1,000	1,000	58	55	68	45	4.62	3.53	2.74	3.22
Washington	520	720	860	1,110	30	58	75	111	1.82	2.64	2.36	1.60
Total	24,230	30,600	38,530	41,600	1,775	2,526	3,563	3,441	2.90	2.60	3.03	2.91

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

[1] Average for season. [2] Crates of 24 pounds.

TABLE 169.—*Asparagus for canning, commercial crop: Acreage, production, and price per ton, by States, 1924–1927*

State	Acreage				Production				Price per ton			
	1924	1925	1926	1927	1924	1925	1926	1927	1924	1925	1926	1927
	Acres	*Acres*	*Acres*	*Acres*	*Tons*	*Tons*	*Tons*	*Tons*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
California	26,200	34,800	46,300	48,300	44,500	45,200	50,900	53,100	98.70	78.36	66.29	70.00
New York	130	130	150	200	200	100	100	100	208.00	249.00	224.00	225.00
Total or average	26,330	34,930	46,450	48,500	44,700	45,300	51,000	53,200	99.19	78.74	66.59	70.28

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

TABLE 170.—*Asparagus: Car-lot shipments, by State of origin, 1920–1927*

State	Crop movement season [1]							
	1920	1921	1922	1923	1924	1925	1926	1927 [2]
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
New Jersey	465	237	154	64	156	150	226	156
Illinois	164	170	161	93	157	165	144	158
South Carolina	89	129	143	154	185	263	364	447
Washington	1	2	5	10	10	31	111	93
California [3]	502	362	304	458	718	1,279	1,503	1,175
Other States	5	2	....	6	9	18	71	124
Total [3]	1,226	902	767	785	1,235	1,906	2,419	2,153

Bureau of Agricultural Economics. Compiled from daily and monthly reports received from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis.

[1] Crop movement season extends from Mar. 1 through July of a given year.
[2] Preliminary.
[3] California includes shipments in other months as follows: 1924, 6 in February; 1925, 10 in February; 1926, 8 in October and 5 in November; 1927, 19 in October and 9 in November.

TABLE 171.—*Beans, snap, for consumption fresh, commercial crop: Acreage, production, and price per hamper, by States, 1924–1927*

State	Acreage				Production				Price per hamper [1]			
	1924	1925	1926	1927	1924	1925	1926	1927	1924	1925	1926	1927
	Acres	*Acres*	*Acres*	*Acres*	*1,000 hampers* [2]	*1,000 hampers* [2]	*1,000 hampers* [2]	*1,000 hampers* [2]	*Dollars*	*Dollars*	*Dollars*	*Dollars*
Early:												
Alabama	1,060	680	710	960	52	45	53	73	2.27	1.37	2.34	1.10
California	------	2,000	3,000	3,120	------	430	645	484	------	1.75	1.45	2.06
Florida	19,780	20,530	16,000	19,490	1,484	1,663	1,184	1,364	2.66	2.52	3.38	2.70
Georgia	1,850	1,300	1,740	2,380	104	68	108	79	1.47	1.65	2.08	.97
Louisiana	4,800	7,120	10,940	13,490	422	527	580	728	2.79	1.42	2.41	1.47
Mississippi	2,800	3,160	3,460	5,260	157	212	239	268	1.74	1.80	2.44	1.34
North Carolina	2,630	3,290	3,390	4,480	316	329	305	381	1.10	1.36	1.89	1.91
South Carolina	4,490	3,560	4,500	5,670	364	295	360	312	1.75	2.10	2.55	1.10
Texas	3,030	4,730	5,240	6,220	361	364	477	286	1.68	1.28	1.63	1.68
Virginia	3,720	3,400	2,860	3,170	480	388	440	434	1.80	2.06	2.26	1.85
Late:												
Arkansas	------	1,600	1,280	1,120	------	98	46	68	------	1.82	1.44	1.40
Illinois	600	550	330	530	48	37	24	29	1.58	1.64	1.08	2.27
Maryland	2,550	3,920	4,250	4,250	178	392	382	340	1.34	.80	1.06	1.75
New Jersey	10,000	11,000	11,000	11,300	1,300	1,265	1,320	1,469	1.73	1.08	1.00	1.45
Tennessee	2,260	1,400	1,670	1,400	264	147	134	84	.92	1.55	1.41	3.19
Delaware	------	------	200	150	------	------	13	18	------	------	1.00	1.25
Total	59,570	68,240	70,570	82,990	5,530	6,260	6,310	6,417	1.98	1.71	1.99	1.84

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

[1] Average for season. [2] 1-bushel hampers.

TABLE 172.—*Beans, snap, for canning, commercial crop: Acreage, production, and price per ton, by States, 1924–1927*

State	Acreage				Production				Price per ton			
	1924	1925	1926	1927	1924	1925	1926	1927	1924	1925	1926	1927
	Acres	*Acres*	*Acres*	*Acres*	*Tons*	*Tons*	*Tons*	*Tons*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Arkansas	660	1,020	630	880	1,300	2,400	900	1,700	50.00	50.00	50.00	50.00
California	620	700	700	450	1,700	1,400	3,200	2,000	62.50	80.00	81.00	85.00
Colorado	1,200	1,800	700	840	3,600	5,400	2,200	1,600	60.00	56.67	53.33	60.00
Delaware	240	1,150	800	400	500	1,700	700	600	44.33	52.50	47.00	48.75
Indiana	600	1,300	850	850	600	3,100	700	2,000	61.33	50.00	55.00	55.59
Louisiana	590	720	800	2,100	500	1,400	400	1,900	50.00	52.50	50.00	50.00
Maine	950	1,210	860	600	2,100	2,500	2,000	1,400	60.00	60.00	57.00	55.83
Maryland	2,500	5,200	3,310	3,300	2,800	7,800	3,000	5,000	60.62	59.91	51.91	54.92
Michigan	1,990	3,000	2,400	2,400	2,200	4,500	2,900	2,200	57.00	59.00	51.20	53.00
Mississippi	1,120	1,670	1,550	1,780	1,100	1,700	3,300	2,700	50.00	52.50	50.00	51.33
New York	5,900	6,370	5,220	5,530	13,000	15,900	6,800	7,700	85.41	85.46	76.86	83.71
Oregon	1,040	1,200	1,250	650	3,100	4,800	3,100	1,600	62.50	60.18	64.00	65.00
Pennsylvania	480	1,320	1,010	890	1,200	2,600	1,200	1,400	45.00	48.75	41.83	50.98
South Carolina	890	1,160	700	700	1,100	2,900	1,000	1,000	49.38	44.00	42.00	45.00
Tennessee	670	1,150	1,080	1,250	1,600	2,100	2,400	1,800	50.00	56.00	40.81	50.00
Utah	360	450	610	880	1,000	1,100	1,500	2,400	50.00	54.62	49.68	53.13
Washington	400	460	270	370	1,100	1,800	1,000	1,000	54.00	46.67	60.00	60.20
Wisconsin	3,400	4,000	3,460	3,910	3,700	8,000	4,200	5,100	71.00	73.19	73.83	75.00
Other States	1,420	2,430	1,350	1,540	2,100	3,600	1,100	2,200	54.44	52.17	57.50	53.98
Total or average	25,030	36,310	27,550	29,320	44,300	74,700	41,600	45,300	66.03	63.82	60.43	62.67

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

TABLE 173.—*Beans, snap: Car-lot shipments, by State of origin, 1920–1927*

State	1920	1921	1922	1923	1924	1925	1926	1927 [1]
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
New York	43	28	11	33	81	62	39	31
New Jersey	90	111	68	15	100	48	56	203
Maryland	150	22	149	49	136	127	107	245
Virginia	155	79	268	101	899	570	841	891
North Carolina	133	128	219	261	559	459	550	487
South Carolina	142	331	503	585	517	334	449	434
Florida	547	407	750	1,848	1,093	2,083	1,094	3,343
Tennessee	20	23	63	81	248	84	174	46
Mississippi	105	79	252	47	85	88	130	143
Louisiana	35	202	90	107	439	683	588	685
Texas	7	39	26	88	210	407	414	470
Other States	37	151	232	113	251	279	322	300
Total	1,473	1,600	2,631	3,328	4,618	5,224	4,854	7,278

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis.

[1] Preliminary.

TABLE 174.—*Cabbage, commercial crop: Acreage, production, and price per ton, by States, 1924–1927*

State	Acreage				Production[1]				Price per ton [2]			
	1924	1925	1926	1927	1924	1925	1926	1927	1924	1925	1926	1927
	Acres	*Acres*	*Acres*	*Acres*	*Tons*	*Tons*	*Tons*	*Tons*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
Early:												
California	5, 940	6, 080	6, 480	6, 400	36, 800	42, 600	42, 100	38, 400	38. 21	18. 33	28. 53	31. 00
Florida	4, 920	4, 650	3, 660	3, 010	41, 800	29, 800	22, 000	14, 700	40. 28	28. 13	48. 44	31. 22
Louisiana	2, 460	4, 540	9, 570	13, 940	12, 300	25, 000	47, 800	66, 900	50. 51	21. 75	39. 54	21. 75
Texas	10, 720	14, 360	14, 300	18, 530	107, 200	76, 100	82, 900	122, 300	21. 92	10. 71	29. 23	9. 76
Second Early:												
Alabama	1, 520	2, 880	3, 900	4, 200	9, 900	14, 400	19, 500	22, 700	42. 81	23. 43	20. 17	19. 60
Georgia	220	440	320	200	1, 300	2, 500	1, 100	1, 300	25. 93	23. 51	38. 88	20. 89
Mississippi	3, 380	2, 760	1, 880	2, 110	14, 500	10, 800	13, 500	10, 600	38. 31	31. 51	26. 95	44. 75
North Carolina	640	630	620	780	3, 200	5, 100	3, 100	3, 300	58. 29	25. 46	30. 00	50. 75
South Carolina	3, 250	3, 500	3, 550	2, 600	19, 500	33, 700	28, 400	23, 400	57. 07	21. 74	28. 56	38. 85
Virginia (Eastern Shore and Norfolk)	4, 000	3, 700	4, 200	4, 440	32, 000	27, 400	23, 500	20, 900	39. 04	36. 22	38. 34	74. 31
Intermediate:												
Delaware	----	----	300	250	----	----	1, 900	1, 700	----	----	24. 00	28. 00
Illinois	820	820	900	940	6, 600	4, 900	5, 800	6, 200	17. 72	47. 72	20. 57	14. 37
Iowa	1, 140	960	1, 000	1, 080	8, 600	4, 800	7, 500	5, 900	11. 88	33. 20	11. 12	26. 37
Kentucky	360	240	240	240	2, 300	1, 700	1, 700	1, 600	25. 00	45. 00	20. 00	40. 00
Maryland	1, 980	1, 870	1, 650	1, 270	15, 800	11, 200	8, 700	7, 900	23. 74	23. 33	52. 65	52. 48
Missouri	750	750	860	860	4, 500	6, 000	6, 900	7, 300	16. 43	50. 00	13. 50	44. 22
New Jersey	5, 100	5, 000	6, 000	6, 600	37, 700	26, 000	41, 400	46, 200	21. 60	40. 00	24. 00	29. 20
New Mexico	400	400	500	600	2, 400	2, 800	4, 000	4, 200	35. 00	42. 50	32. 23	66. 20
New York (L. I.)	2, 470	3, 000	3, 000	3, 090	17, 300	25, 200	24, 000	43, 300	22. 63	26. 00	15. 33	18. 41
Ohio (Washington County)	700	670	600	850	4, 900	5, 400	3, 600	7, 600	16. 27	75. 93	37. 30	38. 25
Tennessee	800	980	1, 560	1, 600	6, 400	5, 900	7, 800	14, 400	31. 12	44. 00	27. 20	40. 88
Virginia (Southwest)	2, 750	3, 000	3, 660	2, 450	21, 700	15, 600	18, 300	17, 200	15. 95	46. 95	11. 86	17. 29
Washington	1, 370	1, 420	1, 240	1, 340	11, 000	15, 600	12, 400	13, 400	44. 94	43. 83	28. 25	60. 37
Late:												
Colorado	4, 010	2, 000	3, 220	2, 100	44, 100	23, 000	43, 800	31, 300	11. 38	18. 96	7. 29	13. 91
Indiana	1, 730	1, 320	1, 990	1, 190	13, 800	9, 200	17, 500	11, 900	6. 25	7. 54	9. 10	16. 60
Michigan	3, 960	3, 160	2, 960	2, 740	38, 000	31, 000	23, 100	20, 300	13. 31	10. 10	9. 48	11. 67
Minnesota	3, 470	3, 390	3, 250	2, 810	33, 000	26, 800	31, 500	27, 500	7. 52	16. 52	8. 10	9. 31
New York (except Long Island)	29, 290	27, 890	28, 560	32, 890	333, 900	283, 600	305, 600	404, 500	5. 65	10. 49	9. 95	5. 96
Ohio (except Washington County)	3, 300	2, 470	2, 620	3, 510	32, 300	22, 200	23, 600	26, 300	7. 84	7. 33	7. 09	7. 05
Oregon	1, 630	1, 630	1, 710	950	10, 600	6, 500	17, 800	9, 500	23. 98	29. 09	17. 31	18. 35
Pennsylvania	1, 680	1, 940	1, 740	1, 300	15, 100	19, 400	15, 800	15, 100	10. 00	21. 78	20. 19	20. 33
Wisconsin	14, 360	13, 560	13, 290	13, 500	127, 800	132, 900	127, 600	114, 800	7. 59	8. 93	9. 32	8. 98
Total	119, 120	119, 970	129, 330	138, 370	1, 066, 300	947, 100	1, 034, 200	1, 162, 600	16. 50	17. 63	17. 79	16. 01

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

[1] Includes sauerkraut.

[2] Average for season.

TABLE 175.—*Cabbage for sauerkraut, commercial crop: Acreage, production, and price per ton, by States, 1924–1927*

State	Acreage				Production				Price per ton			
	1924	1925	1926	1927	1924	1925	1926	1927	1924	1925	1926	1927
	Acres	*Acres*	*Acres*	*Acres*	*Tons*	*Tons*	*Tons*	*Tons*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Colorado	90	100	100	100	1,000	1,300	1,600	1,400	8.00	8.00	6.38	7.00
Illinois	730	420	360	360	5,800	3,400	2,900	4,000	7.00	7.75	7.56	8.27
Indiana	460	220	1,000	360	3,700	1,500	8,000	3,200	7.00	7.00	7.00	8.67
Michigan	1,310	1,190	1,500	1,530	13,000	11,900	15,000	13,800	6.33	6.58	6.50	6.40
Minnesota	460	420	420	430	5,000	4,200	4,400	5,200	5.00	7.00	5.00	6.25
New York	3,060	2,170	3,000	3,960	44,400	26,700	37,800	63,400	6.07	6.45	6.12	6.00
Ohio	1,810	1,410	1,850	2,590	18,100	12,700	20,400	33,700	7.50	8.20	6.00	7.50
Washington	290	330	380	260	2,300	4,000	3,800	2,600	9.00	10.00	10.00	10.00
Wisconsin	2,540	1,970	1,790	2,090	23,900	19,700	16,100	20,100	8.89	6.75	6.47	6.56
Other States	460	460	1,760	1,920	4,000	4,400	14,100	15,700	9.33	13.24	9.97	7.03
Total or average	11,210	8,690	12,100	13,600	121,200	89,800	124,100	163,100	7.08	7.35	6.80	6.70

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

TABLE 176.—*Cabbage: Car-lot shipments, by State of origin, 1920–1926*

State	Crop movement season [1]						
	1920	1921	1922	1923	1924	1925	1926 [2]
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
New York	9,511	9,310	[3] 10,274	9,086	11,816	12,545	12,898
Pennsylvania	239	301	406	317	409	552	523
Ohio	524	318	589	538	658	414	544
Illinois	156	107	144	289	279	198	195
Michigan	598	477	908	732	644	573	287
Wisconsin	4,766	2,908	5,875	6,415	4,955	5,409	5,177
Minnesota	895	592	1,192	989	1,552	873	1,125
Iowa	373	150	566	390	541	265	459
Maryland	219	325	448	220	509	238	166
Virginia	1,542	3,541	2,946	3,343	3,390	2,220	1,805
North Carolina	49	251	213	364	263	371	347
South Carolina [4]	904	3,247	3,235	4,299	1,530	3,421	2,671
Florida [4]	4,579	1,619	2,998	1,172	3,842	1,936	1,667
Kentucky	112	103	73	85	107	45	17
Tennessee	136	181	563	270	348	317	609
Alabama [4]	379	1,001	1,364	1,564	908	1,270	1,586
Mississippi	878	509	1,629	1,134	605	674	990
Louisiana [4]	254	313	334	456	103	644	331
Texas [4]	5,180	1,847	4,049	1,356	7,281	4,048	6,093
Colorado	1,832	2,523	1,964	3,174	1,473	1,432	1,274
Washington	114	170	104	155	52	103	154
California	1,424	882	738	683	370	644	671
Other States	363	358	520	474	430	836	794
Total [4]	[4] 35,027	31,033	[3] 41,132	37,505	42,065	39,028	40,383

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis.

[1] Crop movement season for cabbage becomes important in the South in January and continues for 16 months ending in April with final shipments from northern points.

[2] Preliminary.

[3] New York includes 1 car in May, 1923.

[4] Figures for certain States include in the January shipments, cars moved in preceding calendar year as follows—1920: Florida, 10 cars in December; Louisiana, 4 cars in December; Texas, 2 cars in November, 23 in December. 1921: Florida, 1 car in October, 1 in November, 13 in December; South Carolina, 2 cars in December; Texas, 25 cars in December. 1922: Alabama, 1 car in December; Florida, 15 cars in December; South Carolina, 1 car in November, 32 in December; Texas, 4 cars in November, 110 in December. 1923: Alabama, 3 cars in December; Florida, 19 cars in December; Louisiana, 2 cars in November, 13 in December; South Carolina, 11 cars in November, 152 in December; Texas, 22 cars in November, 39 in December. 1924: Florida, 72 cars in December; Louisiana, 1 car in November, 7 in December; South Carolina, 24 cars in November, 167 in December; Texas, 9 cars in November, 64 in December. 1925: Florida, 26 cars in December; South Carolina, 8 cars in November, 51 cars in December; Texas, 12 cars in November, 38 cars in December. 1926: Florida, 23 cars in December; Louisiana 2 cars in December; South Carolina, 10 cars in December; Texas, 26 cars in December.

TABLE 177.—*Cabbage, Danish: Monthly average l. c. l. price per ton*[1] *to jobbers at eight markets*

Market, and season beginning October[2]	October	November	December	January	February	March
	Dollars	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
Chicago:						
1918	-----	-----	-----	28.00	29.58	41.72
1919	25.82	35.64	68.00	96.56	70.17	-----
1920	11.15	11.09	14.15	18.25	14.07	14.10
1921	[3] 41.85	[3] 47.03	[3] 52.43	44.20	36.60	-----
1922[3]	-----	16.60	24.20	30.20	48.00	60.20
1923	-----	17.00	22.60	33.20	32.00	-----
1924	-----	-----	[4] 30.20	[3] 30.85	[3] 28.00	[3] 25.68
1925	[4] 22.40	[4] 40.00	42.25	54.87	53.50	-----
1926	13.68	24.50	25.00	21.65	-----	-----
1927	[4] 19.80	[4] 19.40	[4] 19.40	-----	-----	-----
New York:						
1918	-----	-----	-----	27.73	27.07	42.36
1919	-----	37.94	71.67	108.67	87.40	98.33
1920	-----	18.64	15.21	18.67	14.50	16.06
1921	39.23	41.52	49.50	52.00	40.40	42.20
1922	20.20	15.80	23.60	26.60	41.60	63.20
1923	26.60	20.20	27.20	33.20	39.40	48.80
1924	17.60	18.40	18.60	28.80	22.60	15.40
1925	23.16	29.24	37.54	56.09	60.66	56.35
1926	21.76	22.54	31.17	25.69	18.70	20.71
1927	18.42	15.32	14.90	-----	-----	-----
Cincinnati:						
1925	25.59	32.92	39.69	62.90	58.91	64.17
1926	28.75	25.14	29.60	27.04	20.59	22.25
1927	23.08	12.62	14.28	-----	-----	-----
Kansas City:[5]						
1925	1.21	1.79	2.51	3.25	3.40	3.68
1926	1.08	1.57	1.67	1.64	1.18	1.71
1927	-----	.99	1.04	-----	-----	-----
Philadelphia:						
1925	19.67	26.77	35.50	58.83	54.20	-----
1926	19.19	18.77	25.91	20.92	16.67	21.78
1927	14.54	12.71	12.27	-----	-----	-----
Pittsburgh:						
1925	21.50	26.76	35.41	61.48	58.26	62.89
1926	[6] 19.46	[6] 19.70	[6] 24.18	[6] 23.30	[6] 16.97	[6] 16.47
1927	[6] 15.00	[6] 11.50	[6 7] 10.57	-----	-----	-----
St. Louis:						
1925	21.64	34.80	43.11	60.00	65.74	-----
1926	20.96	28.62	32.29	29.58	21.58	-----
1927	19.93	16.81	18.17	-----	-----	-----
Washington:						
1925	31.24	35.00	42.72	65.62	-----	-----
1926	28.46	26.88	33.10	[4] 35.40	[4] 29.00	-----
1927	[4] 27.60	[4] 21.20	[4] 18.60	-----	-----	-----

Bureau of Agricultural Economics. Compiled from daily market reports from bureau representatives in the various markets. Average prices as shown are based on stock of good merchantable quality and condition; they are simple averages of daily range of selling prices. In some cases conversions have been made from larger to smaller units or vice versa, in order to obtain comparability.

Earlier data for cities showing prices for 1925–1927 are available in 1925 Yearbook, p. 896, Table 230.

[1] Unless otherwise stated, quotations are on bulk per ton sales.
[2] The season during which Danish cabbage prices are obtainable usually runs from October to March of the following year.
[3] Sacked per ton delivered.
[4] Converted from hundredweight price.
[5] Bulk per hundredweight.
[6] Car-lot sales.
[7] Less than 10 quotations.

TABLE 178.—*Cantaloupes, commercial crop: Acreage, production, and price per crate, by States, 1924–1927*

State	Acreage				Production				Price per crate [1]			
	1924	1925	1926	1927	1924	1925	1926	1927	1924	1925	1926	1927
	Acres	*Acres*	*Acres*	*Acres*	*1,000 crates*[2]	*1,000 crates*[2]	*1,000 crates*[2]	*1,000 crates*[2]	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Early:												
California (Imperial)	31, 000	27, 560	35, 300	39, 760	5, 890	4, 961	5, 048	6, 044	1. 53	2. 07	1. 29	1. 49
Florida	660	370	380	420	67	28	30	34	2. 12	1. 72	1. 30	2. 23
Georgia	2, 980	750	700	710	289	82	70	57	1. 12	2. 35	1. 38	. 76
Texas, Lower Valley	1, 050	750	350	180	105	26	35	21	4. 46	2. 15	1. 00	1. 54
Intermediate:												
Arizona	4, 000	6, 000	7, 000	10, 000	800	1, 350	1, 400	1, 900	1. 02	1. 38	1. 32	1. 46
Arkansas	5, 810	7, 930	7, 310	5, 410	488	460	439	406	1. 43	1. 32	1. 36	2. 19
California (except Imperial)	8, 890	10, 620	8, 380	7, 800	1, 245	1, 699	1, 575	1, 513	1. 31	1. 16	1. 60	1. 80
Delaware	1, 740	2, 500	2, 000	2, 000	167	362	240	220	1. 61	1. 08	. 90	1. 25
Illinois	370	400	400	------	30	52	26	------	1. 60	1. 22	1. 08	------
Indiana	4, 320	4, 820	4, 340	4, 380	458	627	490	504	1. 37	1. 29	1. 41	1. 92
Maryland	5, 930	5, 570	6, 120	7, 100	593	902	998	888	1. 62	. 92	1. 42	2. 20
Nevada	200	270	160	100	22	36	20	19	1. 48	1. 50	1. 18	1. 00
North Carolina	2, 570	2, 010	2, 100	2, 310	193	241	176	266	. 86	1. 14	. 88	. 97
Oklahoma	450	560	630	630	45	66	41	57	1. 11	1. 10	. 80	1. 00
South Carolina	560	400	620	750	58	37	65	68	. 51	1. 47	. 72	. 97
Texas, other	3, 790	2, 250	2, 030	2, 030	265	158	162	152	1. 21	1. 69	1. 91	. 78
Late:												
Colorado	8, 040	7, 900	11, 670	12, 100	1, 166	1, 430	1, 984	1, 815	1. 19	. 91	1. 17	1. 05
Iowa	900	1, 000	1, 120	1, 130	54	88	134	120	1. 06	1. 20	1. 50	1. 00
Kansas	1, 000	450	450	450	125	58	63	52	1. 38	. 90	1. 17	1. 25
Michigan	1, 650	1, 500	1, 280	1, 220	107	250	134	168	1. 44	1. 58	1. 30	1. 23
Nevada	730	660	350	300	80	87	46	56	1. 35	1. 20	1. 12	1. 00
New Jersey	4, 550	4, 320	4, 500	4, 000	787	821	518	440	1. 39	. 93	. 65	. 75
New Mexico	2, 100	2, 600	2, 600	2, 500	420	390	442	250	1. 36	1. 24	1. 06	2. 00
Tennessee	360	560	600	480	65	67	39	32	1. 05	1. 10	1. 15	1. 35
Washington	1, 600	1, 510	1, 300	1, 520	315	275	218	190	1. 30	. 62	1. 28	2. 12
Total	95, 250	93, 260	101, 690	107, 280	13, 834	14, 553	14, 393	15, 272	1. 42	1. 46	1. 29	1. 50

Bureau of Agricultural Economics, estimates based upon returns from crop reporters.

[1] Average for season. [2] Standard crate.

TABLE 179.—*Cantaloupes:*[1] *Car-lot shipments, by State of origin, 1920–1927*

State	Crop movement season [2]							
	1920	1921	1922	1923	1924	1925	1926	1927 [3]
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
Indiana	632	614	894	681	822	1, 089	629	416
Michigan	200	232	465	306	114	146	84	75
Delaware	600	942	843	818	511	657	551	429
Maryland	781	1, 153	1, 233	1, 270	699	1, 116	1, 283	1, 161
North Carolina	358	894	700	620	401	655	401	605
South Carolina	131	281	270	70	116	33	173	180
Georgia	387	619	1, 632	217	586	117	136	94
Arkansas	986	1, 554	1, 002	337	1, 052	1, 245	1, 127	865
Texas	169	156	186	387	456	498	514	231
Colorado	2, 482	3, 288	4, 420	2, 306	3, 229	3, 837	5, 108	3, 945
New Mexico	968	508	275	364	518	574	640	415
Arizona	1, 159	1, 504	1, 558	1, 208	2, 145	3, 833	3, 712	5, 208
Washington	380	208	371	207	298	221	145	239
California [4]	13, 251	13, 166	15, 304	16, 466	19, 932	18, 707	18, 320	22, 324
Other States	460	666	777	646	617	1, 091	601	413
Total	22, 953	25, 815	29, 930	25, 923	31, 496	33, 819	33, 424	36, 600

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis.

[1] Includes honeydews and other miscellaneous melons not separately reported until 1923. The shipments of melons, other than cantaloupes, amounted in 1923 to 1,152 cars; in 1924 to 2,565; in 1925 to 3,654; in 1926 to 6,484; and in 1927 to 6,176.

[2] Crop-movement season extends from Apr. 1 through November of a given year.

[3] Preliminary.

[4] Figures for California include shipments in December as follows: 1920, 1 car; 1925, 18 cars; 1926, 3 cars; 1927, 4 cars.

TABLE 180.—*Carrots, commercial crop: Acreage, production, and price per bushel, by States, 1924–1927*

State	Acreage				Production				Price per bushel [1]			
	1924	1925	1926	1927	1924	1925	1926	1927	1924	1925	1926	1927
	Acres	*Acres*	*Acres*	*Acres*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Early:												
California		1,000	1,800	3,050		570	967	1,525		0.92	0.72	0.72
Louisiana	1,270	2,360	7,330	11,600	298	573	1,261	2,448	1.03	.70	.70	.51
Mississippi	3,640	2,400	1,500	2,040	910	442	300	551	1.14	.76	1.23	.56
Texas	2,250	5,750	3,920	4,340	848	1,501	1,047	998	.45	.34	.32	.43
Late:												
Illinois	800	800	800	800	320	380	352	356	1.12	.55	.75	.66
New Jersey	1,300	1,200	1,400	1,400	403	252	350	336	1.04	1.04	1.00	.92
New York	2,220	2,250	2,250	2,860	1,305	1,082	1,246	1,788	.71	.61	.51	.46
Total	11,480	15,760	19,000	26,090	4,084	4,800	5,523	8,002	.84	.60	.64	.56

Bureau of Agricultural Economics, estimates based upon returns from crop reporters.

[1] Average for season.

TABLE 181.—*Carrots: Car-lot shipments, by State of origin, 1920–1927*

State	Crop movement season [1]							
	1920	1921	1922	1923	1924	1925	1926	1927 [2]
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
Alabama					5			
Arizona							11	11
California	111	[3] 19	21	[4] 24	[5] 157	[6] 278	[7] 557	[8] 2,220
Colorado	1	9	4	12	26	29	62	7
Florida	5	3		3		6	3	2
Georgia				5	4			
Idaho						1		
Illinois	53	62	82	24	3	23	2	
Indiana	81	13	41	9	40	28	31	4
Iowa			1	2				
Kentucky	1	1			20	5		
Louisiana	28	43	62	58	32	106	70	[9] 177
Maine	8	7	2	2	3			
Massachusetts	7	9	11	14	21	16	37	6
Michigan	11	33	25	35	55	54	75	
Minnesota	1	6	7	8	5	59	84	67
Mississippi	77	81	304	142	266	197	209	496
Missouri						4		
Montana	3	3	2	3	1		4	
Nevada								1
New Jersey	32	32	26	34	18	48	44	76
New York	1,158	1,247	1,523	1,410	2,246	1,841	1,846	805
North Carolina			1		3	11	28	11
Ohio	3	6	14	1	4	33	38	24
Oregon			1		2	6	9	
Pennsylvania	2	2		2	8	7		
South Carolina	10	52	62	77	[10] 78	41	5	19
Tennessee						8		3
Texas	5	198	48	65	282	[11] 575	[12] 1,136	[13] 905
Utah		3			7	12	9	
Vermont							1	
Virginia	3	1	10	2	1	40	10	44
Washington	2	9	5	21	11	8	30	
Wisconsin			4	3	1	6	1	3
Wyoming						1	1	
Total	1,602	1,839	2,256	1,956	3,299	3,443	4,303	4,890

Bureau of Agricultural Economics. Compiled from monthly reports received by the bureau from local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis.

[1] Crop-movement season begins Jan. 1 in such early shipping States as California, Texas, and Louisiana and extends through June of the following year in order to include shipments from storage in Northern States and to have totals comparable with acreage and production figures.
[2] Incomplete, includes shipments through November only.
[3] Includes 1 car in December, 1920.
[4] Includes 1 car in December, 1922.
[5] Includes 1 car in November, 1923, and 2 in December, 1923.
[6] Includes 13 cars in December, 1924.
[7] Includes 1 car in October, 1925, 48 cars in November, 1925, and 18 cars in December, 1925.
[8] Includes 17 cars in October, 1926, 87 cars in November, 1926, and 188 cars in December, 1926.
[9] Includes 1 car in December, 1926.
[10] Includes 1 car in December, 1923.
[11] Includes 14 cars in December, 1924.
[12] Includes 40 cars in December, 1925.
[13] Includes 3 cars in November, 1926, and 14 cars in December, 1926.

TABLE 182.—*Cauliflower, commercial, crop: Acreage, production, and price per crate, by States, 1924–1927*

State	Acreage				Production				Price per crate [1]			
	1923–4	1924–5	1925–6	1926–7	1923–4	1924–5	1925–6	1926–7	1923–4	1924–5	1925–6	1926–7
	Acres	*Acres*	*Acres*	*Acres*	*1,000 crates*	*1,000 crates*	*1,000 crates*	*1,000 crates*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
California [2]	6, 550	6, 610	10, 500	8, 950	1, 703	2, 148	3, 224	2, 452	1. 21	1. 11	0. 88	1. 00
Colorado	400	1, 000	1, 100	800	64	160	99	70	1. 11	. 71	1. 15	1. 78
New Jersey	300	400	300	250	42	52	44	38	1. 40	1. 38	1. 15	1. 50
New York	4, 350	5, 530	5, 560	5, 060	652	713	1, 334	1, 270	1. 85	1. 55	1. 36	1. 83
Oregon [2]	1, 400	1, 600	5, 000	2, 100	280	320	825	420	1. 45	1. 05	. 69	1. 18
Utah	------	40	60	180	------	10	12	49	------	2. 50	2. 00	2. 00
Total	13, 000	15, 180	22, 520	17, 340	2, 741	3, 403	5, 538	4, 299	1. 39	1. 19	. 98	1. 29

Bureau of Agricultural Economics. Estimates based upon return from crop reports.

[1] Average for season. [2] Season of California and Oregon begins in October of the previous year.

TABLE 183.—*Cauliflower: Car-lot shipments, by State of origin, 1920–1926*

State	Crop movement season [1]						
	1920	1921	1922	1923	1924	1925	1926 [2]
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
New York	781	567	683	653	734	834	1, 019
Colorado	----------	3	4	101	61	[3] 191	220
Oregon	76	134	282	374	109	1, 246	780
California	2, 957	3, 629	3, 604	3, 054	3, 404	4, 357	4, 729
Other States	39	30	35	121	146	[4] 100	[5] 143
Total	3, 853	4, 363	4, 608	4, 303	4, 454	[6] 6, 728	[5] 6, 891

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis.

[1] Crop movement season extends from July 1 through June of the following year.
[2] Preliminary.
[3] Includes 1 car in June, 1925.
[4] Includes 2 cars in July, 1926.
[5] Includes 1 car in May and 6 in June, 1926.
[6] Includes 1 car in June, 1925, and 2 cars in July, 1926.

TABLE 184.—*Celery, commercial crop: Acreage, production, and price per crate, by States, 1924–1927*

State	Acreage				Production				Price per crate [1]			
	1924	1925	1926	1927	1924	1925	1926	1927	1924	1925	1926	1927
	Acres	*Acres*	*Acres*	*Acres*	*1,000 crates* [2]	*1,000 crates* [2]	*1,000 crates* [2]	*1,000 crates* [2]	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Early: Florida	4, 000	4, 320	3, 520	4, 240	1, 900	2, 000	1, 320	1, 908	2. 58	2. 24	3. 00	2. 08
Late:												
California	6, 330	6, 250	8, 550	8, 350	1, 386	1, 369	2, 078	1, 991	1. 34	1. 49	1. 82	1. 49
Colorado	720	920	940	940	248	386	282	306	2. 51	3. 16	1. 22	1. 70
Michigan	4, 110	3, 860	3, 720	3, 760	645	780	521	846	1. 97	1. 68	1. 92	1. 38
New Jersey	1, 370	1, 420	1, 350	1, 300	522	416	417	370	1. 19	1. 52	1. 09	. 82
New York	4, 790	4, 660	4, 890	5, 090	1, 676	1, 351	1, 506	1, 654	1. 40	1. 27	1. 50	1. 20
Ohio	710	680	540	450	124	160	120	128	1. 56	1. 68	1. 68	2. 43
Oregon [5]	300	340	360	410	112	111	144	123	1. 72	1. 69	1. 83	1. 81
Pennsylvania	380	380	260	280	128	112	88	81	2. 67	1. 11	1. 46	1. 42
Total	22, 710	22, 830	24, 130	25, 320	6, 741	6, 685	6, 476	7, 407	1. 83	1. 79	1. 91	1. 56

Bureau of Agricultural Economics estimates based upon returns from crop reporters.

[1] Average for season. [2] New York crate, two-thirds size.

TABLE 185.—*Celery: Car-lot shipments, by State of origin, 1920–1926*

State	Crop movement season [1]						
	1920	1921	1922	1923	1924	1925	1926 [3]
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
New York	3,110	3,047	3,248	3,741	4,529	4,492	4,898
New Jersey	94	219	115	219	177	149	138
Pennsylvania	186	224	212	223	225	208	194
Ohio	46	67	76	55	64	71	51
Michigan	954	1,031	1,626	1,486	1,332	2,224	1,880
Florida	4,218	4,954	6,308	7,219	7,952	5,504	5,504
Colorado	305	211	222	125	197	399	211
Oregon	16	53	82	205	363	398	511
California	3,472	2,617	4,337	4,693	4,175	[3] 5,953	[4] 7,564
Other States	23	[5] 19	52	76	84	66	48
Total	12,424	[5] 12,442	16,368	18,042	19,098	[3] 19,461	[4] 20,999

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country.
Shipments as shown in car lots included those by boat reduced to car-lot basis.

[1] Crop movement season extends from June 1 of one year through May of the following year, except in Florida, where the season extends through June.
[2] Preliminary.
[3] Includes 50 cars in April and 190 cars in May, 1925.
[4] Includes 129 cars in April, 145 cars in May, 1926, and 18 cars in June, 1927.
[5] Includes 1 car from Texas in May, 1921.

TABLE 186.—*Corn, sweet, for canning, commercial crop: Acreage, production, and price per ton, by States, 1924–1927*

State	Acreage				Production				Price per ton			
	1924	1925	1926	1927	1924	1925	1926	1927	1924	1925	1926	1927
	Acres	*Acres*	*Acres*	*Acres*	*Tons*	*Tons*	*Tons*	*Tons*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Delaware	4,400	5,000	3,000	3,500	8,400	13,500	7,200	8,400	12.00	18.00	13.35	10.60
Illinois	60,560	70,650	58,280	39,050	103,000	169,600	145,700	78,100	13.58	14.29	14.23	11.06
Indiana	21,000	36,990	30,380	17,010	35,700	88,800	88,100	23,800	14.74	14.83	10.18	10.41
Iowa	55,500	70,720	50,480	26,750	83,200	190,900	151,400	61,500	9.55	11.14	10.35	8.96
Maine	13,390	15,630	14,650	8,260	36,200	45,300	46,900	23,100	29.10	29.76	28.72	22.30
Maryland	32,500	42,820	33,850	27,500	58,500	115,600	74,500	49,500	14.69	17.67	14.08	11.78
Michigan	11,000	13,630	11,080	9,400	13,200	34,100	22,200	14,100	14.76	14.30	12.54	15.00
Minnesota	21,000	30,540	24,450	18,500	52,500	64,100	73,400	33,300	9.46	10.28	9.93	10.00
Nebraska	7,000	8,880	6,970	4,600	12,600	19,500	18,800	11,500	9.18	10.94	10.07	8.32
New Hampshire	1,200	1,470	1,050	780	3,400	3,800	2,400	1,800	24.40	25.00	23.65	21.60
New York	26,000	31,350	27,420	20,290	46,800	72,100	60,300	32,500	19.59	20.74	18.24	18.80
Ohio	27,450	34,520	26,380	18,730	38,400	110,500	71,200	30,000	10.64	13.61	10.14	10.00
Pennsylvania	3,200	6,850	4,840	2,800	6,400	24,700	9,700	3,600	17.72	18.93	13.00	12.00
Vermont	2,500	2,620	2,290	1,870	7,000	6,800	5,000	4,100	20.00	19.94	21.30	19.10
Wisconsin	13,720	17,740	17,350	10,410	17,800	44,400	29,500	13,500	11.93	12.33	11.81	10.66
Other States	2,370	4,500	4,840	4,380	4,700	10,400	9,700	7,000	13.50	14.00	12.00	13.40
Total or average	302,790	393,910	317,310	213,830	527,800	1,014,100	816,000	395,800	14.17	15.04	13.23	12.13

Bureau of Agricultural Economics. Estimates based upon return from crop reporters.

TABLE 187.—*Corn, canned: Pack [1] in the United States, 1917–1927*

State	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927
	1,000 cases	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*
Maine	567	1,113	1,652	1,588	911	1,066	923	1,204	1,693	1,347	806
New York	257	489	1,014	829	564	616	431	749	1,311	1,038	676
Ohio	1,200	1,584	1,300	1,544	850	1,073	1,390	787	2,375	1,735	846
Indiana	742	513	586	861	709	665	1,208	846	2,223	2,044	703
Illinois	2,422	2,199	2,225	2,271	1,711	1,939	2,833	2,310	4,030	3,053	1,961
Wisconsin	166	373	635	590	576	625	648	388	1,148	843	310
Minnesota	202	309	456	643	573	598	898	1,199	1,541	1,762	1,088
Iowa	2,280	2,300	2,496	3,246	1,190	1,959	2,382	1,764	4,105	3,361	1,377
Maryland	2,002	2,033	2,031	2,217	1,130	1,944	2,256	1,707	3,678	2,133	1,493
Other States	965	809	1,045	1,251	629	934	1,134	1,087	2,216	1,753	1,087
United States	10,803	11,722	13,550	15,040	8,843	11,419	14,106	12,131	24,320	19,069	10,347

Bureau of Agricultural Economics. Compiled from National Canners' Association data.

[1] Stated in cases of 24 No. 2 cans.

TABLE 188.—*Cucumbers for consumption fresh, commercial crop: Acreage production, and price per hamper, by States, 1924–1927*

State	Acreage				Production				Price per hamper [1]			
	1924	1925	1926	1927	1924	1925	1926	1927	1924	1925	1926	1927
	Acres	*Acres*	*Acres*	*Acres*	*1,000 hampers [2]*	*1,000 hampers [2]*	*1,000 hampers [2]*	*1,000 hampers [2]*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
Early:												
Alabama	2,540	2,240	2,880	3,830	432	417	472	582	0.77	1.48	0.56	0.97
California		3,210	2,560	2,120		491	369	337		1.09	.93	.97
Florida	12,370	10,830	7,590	7,440	1,002	1,256	1,108	1,004	3.30	2.36	2.51	1.92
Georgia	2,260	610	720	720	120	70	67	90	1.20	1.15	.85	1.26
Louisiana	540	1,800	3,040	2,760	108	139	316	317	1.77	1.96	1.59	.79
South Carolina	3,560	2,900	4,120	4,300	605	458	490	636	.57	1.58	1.02	1.37
Texas, S. dist	950	980	3,000	4,150	163	66	357	415	1.70	2.14	1.55	1.05
Virginia	1,730	1,560	1,610	1,650	260	257	205	214	.80	.75	1.15	.91
Second early: N. Carolina	3,560	5,310	4,570	4,340	890	860	530	764	.94	.93	1.13	.90
Intermediate:												
Arkansas	500	1,410	1,760	1,760	50	151	150	176	1.11	1.04	1.01	1.51
Delaware	1,000	1,400	1,500	1,120	160	158	255	202	1.71	.57	.56	.90
Illinois (southern)	520	740	560	580	104	130	67	56	1.58	.80	.78	1.21
Maryland	1,420	2,080	2,080	1,700	220	416	260	292	1.54	.53	.56	1.30
New Jersey	2,000	2,500	2,100	2,000	342	500	420	370	1.55	.67	.95	1.25
Late: New York	3,400	4,490	3,950	3,950	544	516	490	585	1.54	.60	.91	.98
Total	36,350	42,060	42,070	42,400	5,000	5,885	5,550	6,040	1.57	1.28	1.29	1.21

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

[1] Average for season. [2] Bushel hamper.

TABLE 189.—*Cucumbers for pickles, commercial crop: Acreage, production, and price per bushel, by States, 1924–1927*

State	Acreage				Production				Price per bushel			
	1924	1925	1926	1927	1924	1925	1926	1927	1924	1925	1926	1927
	Acres	*Acres*	*Acres*	*Acres*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
California	2,150	3,210	2,560	2,120	245	491	369	337	1.00	1.09	0.93	0.97
Colorado	2,800	3,500	2,900	3,130	98	357	177	156	1.00	1.00	.87	.75
Illinois	1,310	1,630	940	870	37	114	47	30	1.39	1.39	1.22	1.24
Indiana	7,240	8,430	7,250	7,470	188	430	392	284	1.30	1.11	1.12	.93
Iowa	2,250	2,850	800	340	45	177	34	15	1.07	1.09	1.11	.90
Michigan	35,440	36,810	25,030	20,360	851	2,025	1,051	611	1.13	1.11	.98	.90
Minnesota	3,910	4,340	3,000	1,770	67	195	135	53	1.25	1.03	.90	.73
Missouri	830	1,050	2,800	670	13	61	98	35	1.42	.91	.82	1.00
New York	1,530	1,320	920	680	50	152	32	35	1.25	1.00	.88	1.27
Ohio	1,560	2,250	1,600	1,790	50	162	88	63	1.48	1.26	.90	1.02
Washington	430	670	530	430	13	97	32	20	1.00	1.00	.90	.82
Wisconsin	17,990	20,960	11,950	8,500	504	1,216	598	340	1.00	1.03	.92	1.08
Other States	8,440	13,110	9,460	9,930	388	1,337	615	675	1.29	.78	.92	.96
Total or average	85,410	100,130	69,740	58,060	2,549	6,814	3,668	2,663	1.14	1.02	.96	.95

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

TABLE 190.—*Cucumbers: Car-lot shipments by State of origin, 1920–1927*

State	1920	1921	1922	1923	1924	1925	1926	1927 [1]
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
New York	312	540	305	383	694	686	450	614
New Jersey	287	271	164	258	276	481	261	307
Ohio	52	118	124	68	111	91	187	203
Illinois	142	164	68	15	77	245	150	101
Delaware	256	137	191	225	240	302	304	367
Maryland	297	343	368	446	311	598	479	691
Virginia	83	19	221	84	387	448	200	339
North Carolina	408	641	687	1,175	1,639	1,562	860	919
South Carolina	525	664	887	720	918	704	687	902
Georgia	1	8	211	45	154	72	62	70
Florida	835	1,414	2,034	1,647	1,381	1,963	2,048	2,321
Alabama	259	109	702	367	570	706	684	583
Texas	95	64	119	46	147	72	316	178
California		89	68	125	23	125	86	62
Other States	137	256	110	96	248	347	483	465
Total	3,689	4,832	6,340	5,700	7,182	8,492	7,272	8,182

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis.

[1] Preliminary.

TABLE 191.—*Eggplant, commercial crop: Acreage, production, and price per bushel, by States, 1924–1927*

State	Acreage				Production				Price per bushel [1]			
	1924	1925	1926	1927	1924	1925	1926	1927	1924	1925	1926	1927
	Acres	*Acres*	*Acres*	*Acres*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Florida	1,620	1,400	1,020	630	502	384	392	202	1.30	1.30	1.34	1.26
Louisiana	------	800	1,060	890	------	152	138	139	------	1.05	1.05	1.00
New Jersey	1,000	1,100	1,000	1,100	283	330	220	330	1.14	.73	1.00	.80
Texas	70	190	180	250	10	38	41	75	.61	1.00	1.00	.45
Total	2,690	3,490	3,260	2,870	795	904	791	746	1.24	1.04	1.18	.93

Bureau of Agricultural Economics, estimates based upon returns from crop reporters.

[1] Average for season.

TABLE 192.—*Lettuce, commercial crop: Acreage, production, and price per crate, by States, 1924–1927*

State	Acreage				Production				Price per crate [1]			
	1924	1925	1926	1927	1924	1925	1926	1927	1924	1925	1926	1927
Early:	*Acres*	*Acres*	*Acres*	*Acres*	*1,000 crates*[2]	*1,000 crates*[2]	*1,000 crates*[2]	*1,000 crates*[2]	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Arizona	5,800	6,400	8,500	14,800	1,305	1,440	1,912	3,036	1.18	1.06	1.90	1.35
California [3]—												
Imperial	20,000	23,000	28,000	34,400	3,700	4,600	4,900	3,578	1.71	1.71	1.95	1.34
Other	18,060	24,680	37,100	42,010	3,919	4,368	5,565	6,049	1.16	1.16	1.37	1.75
Florida	3,490	3,400	1,500	1,840	914	765	252	294	1.29	1.41	2.21	1.62
North Carolina	1,540	1,730	1,420	1,490	260	467	379	420	2.82	1.98	2.00	1.87
South Carolina	1,120	1,480	780	700	151	247	133	158	1.92	1.69	1.81	1.59
Texas	760	680	640	640	133	68	72	69	.86	1.38	1.19	1.00
Virginia	300	300	300	300	36	39	38	50	1.77	2.07	1.70	1.50
Late:												
Colorado	5,600	10,500	13,240	13,240	476	1,396	1,523	1,536	2.16	1.58	1.43	1.63
Idaho	1,420	1,500	1,200	1,120	192	180	157	218	1.50	1.86	1.47	.96
New Jersey	2,060	2,200	2,400	2,450	546	541	503	612	1.42	1.64	1.08	2.01
New Mexico	250	1,400	1,030	410	56	280	77	38	1.55	1.76	1.66	.75
New York	6,290	6,820	7,200	6,480	1,113	1,323	1,246	1,147	2.07	1.42	1.60	1.48
Oregon	300	300	360	300	48	45	18	15	1.50	1.92	1.42	1.25
Pennsylvania	70	70	80	80	5	11	12	10	2.17	2.50	1.24	1.50
Washington	1,400	1,450	1,600	1,850	315	290	336	400	1.14	2.50	1.30	1.48
Wyoming	200	110	210	200	52	16	27	22	1.85	1.50	1.40	1.20
Total	65,660	86,020	105,560	122,310	13,221	16,076	17,150	17,652	1.50	1.48	1.64	1.56

Bureau of Agricultural Economics, estimates based upon returns from crop reporters.

[1] Average for season.
[2] Crates of 4 dozen heads each.
[3] Crop year beginning October of previous year.

TABLE 193.—*Lettuce: Car-lot shipments by State of origin, 1920–1927*

State	1920	1921	1922	1923	1924	1925	1926	1927 [1]
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
New York	1,775	3,240	3,167	3,817	3,698	3,821	3,019	3,492
New Jersey	208	469	571	456	417	403	303	305
North Carolina	207	445	622	718	714	537	540	446
South Carolina	121	716	987	577	423	736	372	369
Florida	2,940	2,267	3,323	3,146	2,257	1,519	987	937
Idaho	25	180	889	1,241	532	501	398	186
Colorado	129	234	812	1,436	1,036	3,096	2,795	2,824
Arizona	254	168	678	1,108	2,049	3,519	4,906	9,117
Washington	354	635	812	1,081	674	820	904	1,150
California	7,358	9,850	9,744	15,113	18,480	21,618	27,341	27,447
Other States	417	534	635	792	655	676	540	397
Total	13,788	18,738	22,240	29,485	30,935	37,306	42,105	46,670

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis.

[1] Preliminary.

TABLE 194.—*Onions, commercial crop: Acreage, production, and price per bushel, by States, 1924–1927*

State	Acreage				Production				Price per bushel [1]			
	1924	1925	1926	1927	1924	1925	1926	1927	1924	1925	1926	1927
Early (Bermuda and Creole):	*Acres*	*Acres*	*Acres*	*Acres*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
California	1, 540	1, 550	2, 850	3, 950	522	488	926	1, 118	0. 92	1. 74	1. 39	1. 80
Louisiana	1, 670	2, 320	2, 750	2, 900	209	278	352	316	. 89	1. 36	1. 17	1. 22
Texas	10, 230	9, 580	12, 510	11, 220	2, 066	2, 203	2, 552	2, 199	1. 32	1. 40	1. 36	1. 69
Total	13, 440	13, 450	18, 110	18, 070	2, 797	2, 969	3, 830	3, 633	1. 21	1. 45	1. 35	1. 68
Intermediate (domestic):												
Iowa	750	740	780	800	273	313	246	206	1. 24	2. 36	. 94	1. 35
Kentucky	1, 100	750	1, 000	800	330	210	250	110	1. 25	1. 58	. 50	1. 00
New Jersey	2, 400	2, 400	2, 900	2, 900	653	432	580	696	1. 53	1. 70	1. 00	1. 25
Texas (Collin Co.)	1, 200	1, 300	1, 500	1, 050	192	214	262	131	. 91	. 92	. 84	1. 89
Virginia	1, 000	800	900	600	200	100	90	89	1. 13	2. 00	. 76	. 75
Washington	1, 760	1, 270	1, 800	1, 450	484	286	540	566	. 98	. 75	. 45	. 59
Late (domestic):												
California	4, 650	5, 850	6, 000	4, 780	1, 279	1, 755	1, 776	1, 898	. 78	1. 16	. 64	. 69
Colorado	3, 410	3, 520	3, 700	4, 300	921	1, 144	1, 018	1, 054	. 58	. 78	. 50	. 45
Idaho	520	1, 400	950	1, 900	208	637	276	902	. 85	. 71	. 48	. 47
Illinois	880	840	670	670	198	218	168	201	. 95	. 85	. 98	. 87
Indiana	8, 350	8, 100	8, 440	8, 100	2, 088	2, 308	2, 726	2, 738	. 64	. 98	. 56	. 59
Iowa (late crop)	1, 100	1, 400	1, 600	1, 470	418	556	480	400	. 81	. 99	. 46	. 67
Massachusetts	3, 190	3, 920	4, 420	4, 550	1, 244	1, 533	1, 746	1, 342	. 89	1. 08	. 62	. 74
Michigan	2, 970	2, 680	3, 370	3, 000	1, 093	713	1, 284	1, 275	. 60	. 86	. 63	. 54
Minnesota	1, 700	1, 560	1, 870	2, 180	468	452	527	691	. 71	. 91	. 54	. 51
New York	7, 750	8, 910	7, 580	8, 460	3, 255	3, 430	2, 729	3, 046	. 79	. 97	. 67	. 59
Ohio	6, 240	3, 460	5, 300	7, 000	2, 184	1, 031	1, 367	2, 352	. 67	1. 06	. 65	. 60
Oregon	950	1, 050	1, 130	850	323	398	358	288	. 82	. 71	. 51	. 58
Pennsylvania	250	190	180	180	81	53	50	54	. 88	1. 61	. 95	. 75
Utah	300	500	800	900	138	330	360	315	. 75	. 70	. 60	. 50
Wisconsin	1, 180	960	1, 200	1, 600	319	341	348	507	. 68	. 90	. 51	. 58
Total	51, 650	51, 600	56, 090	57, 540	16, 349	16, 454	17, 181	18, 861	. 79	1. 02	. 62	. 64
Grand total	65, 090	65, 050	74, 200	75, 610	19, 146	19, 423	21, 011	22, 494	. 86	1. 08	. 75	. 81

Bureau of Agricultural Economics, estimates based upon returns from crop reporters.

[1] Average for season.

TABLE 195.—*Onions: Car-lot shipments by State of origin, 1920–1926*

State	Crop movement season [1]						
	1920	1921	1922	1923	1924	1925	1926 [2]
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
Massachusetts	3, 914	2, 244	1, 912	2, 454	2, 481	2, 856	3, 586
New York	3, 384	2, 890	2, 812	5, 505	5, 335	5, 109	3, 720
New Jersey	371	429	479	335	403	235	253
Ohio	3, 239	1, 749	4, 493	2, 714	4, 492	1, 856	2, 287
Indiana	4, 124	1, 972	4, 684	4, 610	3, 735	4, 158	4, 493
Illinois	409	251	487	378	241	291	158
Michigan	939	417	1, 867	1, 222	1, 623	1, 402	2, 171
Wisconsin	409	90	330	273	212	361	270
Minnesota	287	169	500	189	487	674	682
Iowa	830	416	927	882	1, 176	1, 365	1, 434
Virginia	139	280	371	274	345	138	178
Kentucky	304	382	258	263	266	152	134
Texas	4, 957	4, 209	4, 630	3, 027	3, 918	3, 941	5, 321
Idaho	28	50	161	256	322	876	531
Colorado	150	447	651	928	1, 064	1, 809	1, 758
Utah	9	54	170	177	216	599	662
Washington	810	702	765	1, 126	1, 016	1, 000	1, 200
Oregon	27	343	263	392	558	681	678
California	4, 802	3, 542	4, 349	3, 427	2, 671	3, 603	3, 013
Other States	341	254	369	330	235	540	536
Total	29, 473	20, 890	30, 478	28, 762	30, 796	31, 646	33, 065

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis.

[1] Crop movement season extends from March 1 of one year through June of the following year.
[2] Preliminary.

TABLE 196.—*Onions: Average l. c. l. price per 100 pounds to jobbers, at five markets, 1920–1927*

Market, and season beginning August	Various common varieties								Bermudas					
									Apr.		May [2]		June [3]	
	Aug.[1]	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Yellow	Crystal White wax	Yellow	Crystal White wax	Yellow	Crystal White wax
	Dollars	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
New York:														
1920	2.53	2.24	1.56	1.55	1.23	1.31	0.98	0.80	4.34	3.46	3.15	3.79	2.93	3.01
1921	2.80	3.43	5.06	5.63	5.45	7.34	8.25	8.21	7.66	6.20	4.14	3.79	3.91	3.54
1922	2.08	1.52	1.72	2.00	2.99	2.83	2.45	2.98	------	------	5.31	5.19	------	------
1923	2.68	3.21	3.26	2.75	2.76	2.73	2.33	2.20	------	------	3.27	------	------	------
1924	2.17	1.89	1.84	2.08	2.84	3.05	3.05	2.86	4.19	5.04	6.16	5.01	7.18	------
1925	2.94	2.36	2.86	2.80	3.26	2.95	2.69	2.81	------	------	4.37	------	3.27	------
1926	2.26	1.59	1.82	1.92	2.74	3.08	2.76	3.46	5.36	------	5.64	------	6.64	------
1927	2.17	1.72	1.60	1.72	2.18	------	------	------	------	------	------	------	------	------
Chicago														
1920	2.06	1.94	1.59	1.56	1.31	1.16	.98	.93	3.48	4.37	2.79	3.73	2.53	3.27
1921	2.58	3.61	4.47	5.11	5.62	7.09	7.64	8.53	6.21	6.47	4.05	4.20	3.43	3.89
1922	2.12	1.61	1.70	2.22	2.29	2.56	3.44	3.38	5.96	------	5.15	5.79	------	------
1923	3.19	3.48	3.29	3.22	3.07	3.27	3.04	2.79	5.17	------	3.37	4.10	------	------
1924	3.11	2.73	2.43	2.52	2.88	3.96	4.38	4.32	4.15	5.46	6.33	6.75	7.94	8.30
1925	3.41	2.90	3.11	3.35	3.46	3.20	2.81	3.18	5.60	5.92	3.97	4.71	3.21	3.61
1926	2.25	2.07	1.92	1.69	2.46	3.31	3.42	3.92	5.27	5.96	5.66	6.15	5.57	6.07
1927	2.57	1.74	1.68	1.65	2.02	------	------	------	------	------	------	------	------	------
Philadelphia:														
1920	------	2.03	1.49	1.51	1.23	1.27	.98	.87	4.04	3.88	3.26	3.70	2.75	2.61
1921	3.02	3.80	4.80	5.34	5.52	6.93	8.00	8.98	7.03	6.00	4.13	4.04	4.07	------
1922	2.19	1.63	1.57	1.82	2.73	2.90	2.54	3.20	6.03	------	------	------	------	------
1923	3.07	3.45	3.09	2.73	2.61	2.58	2.21	2.11	4.76	------	3.42	------	------	------
1924	2.91	1.99	1.70	1.76	2.59	3.01	3.00	2.82	4.19	------	6.45	------	7.46	------
1925	3.07	2.48	2.38	2.44	2.63	2.80	2.64	2.74	------	------	4.53	------	3.64	------
1926	1.82	1.68	1.83	1.69	2.10	2.85	2.56	3.11	5.57	------	5.55	------	5.79	------
1927	2.02	1.67	1.54	1.49	1.68	------	------	------	------	------	------	------	------	------
St. Louis:														
1920	2.40	1.67	1.55	1.55	------	1.17	.91	.70	3.30	4.40	2.83	3.47	------	3.20
1921	2.95	3.70	4.88	5.45	5.68	6.97	7.90	8.52	5.95	5.67	3.17	4.19	3.37	------
1922	------	------	1.89	2.20	2.30	2.92	2.52	3.14	------	------	5.05	5.20	------	------
1923	2.55	3.45	3.45	3.23	3.05	3.45	3.39	2.90	4.11	------	2.94	3.73	------	------
1924	------	2.23	1.70	1.86	2.79	3.82	3.78	3.58	3.86	4.65	5.97	6.29	7.40	8.29
1925	------	2.64	2.67	2.98	2.86	2.65	2.39	2.16	------	------	3.64	4.82	3.05	3.57
1926	2.13	1.95	2.08	1.87	2.67	2.76	3.09	3.14	5.11	5.78	5.40	5.75	5.32	6.17
1927	2.58	1.78	1.70	1.49	1.84	------	------	------	------	------	------	------	------	------
Boston:														
1925	3.11	2.50	2.33	2.91	2.93	2.92	2.63	2.99	5.69	------	4.69	------	3.95	------
1926	1.89	1.73	1.75	1.81	2.53	2.99	2.95	3.52	5.55	------	5.95	------	6.13	------
1927	1.98	1.82	1.70	1.69	2.16	------	------	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Compiled from daily market reports from bureau representatives in the various markets.

Average prices as shown are based on stock of U. S. No. 1 grade; they are simple averages of daily range of selling prices. In some cases conversions have been made from larger to smaller units, or vice versa, in order to obtain comparability.

[1] Quotations began Aug. 23, 1920; Aug. 22, 1921; Aug. 7, 1922; Aug. 14, 1923; Aug. 22, 1924; July 22, 1925.

[2] Last reported quotations of season June 11, 1921; June 14, 1922; May 29, 1923; June 4, 1924; June 10, 1925.

TABLE 197.—*Peas, green, for consumption fresh; commercial crop: Acreage, production, and price per hamper, by States, 1924–1927*

State	Acreage				Production				Price per hamper [1]			
	1924	1925	1926	1927	1924	1925	1926	1927	1924	1925	1926	1927
	Acres	*Acres*	*Acres*	*Acres*	*1,000 hampers* [2]	*1,000 hampers* [2]	*1,000 hampers* [2]	*1,000 hampers* [2]	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Early:												
Arizona	450	1,150	400	500	14	52	11	25	2.72	1.41	1.56	1.33
California (Imperial)	950	1,400	4,000	5,700	52	66	400	365	2.14	2.56	2.36	2.12
California (other [3])	5,110	5,100	11,950	21,110	266	224	598	2,132	3.15	2.76	4.56	1.98
Florida	1,330	2,250	760	700	78	86	40	34	3.70	2.84	2.67	3.50
Louisiana	------	530	760	1,600	------	26	37	78	------	1.32	1.94	1.67
Mississippi	2,380	2,000	2,050	2,250	162	104	195	169	1.60	2.16	1.81	1.58
North Carolina	4,770	3,840	3,880	3,490	343	415	213	244	1.09	1.42	1.32	1.92
South Carolina	1,720	1,160	1,700	2,000	71	93	95	90	1.94	2.05	1.26	1.09
Virginia	2,000	2,300	2,440	1,730	170	184	117	168	1.76	2.07	.93	1.57
Late:												
Colorado	850	2,560	1,940	3,870	68	256	120	286	1.85	3.07	1.94	2.84
Delaware	------	------	60	80	------	------	4	7	------	------	2.25	2.00
Maryland	------	450	450	450	------	29	27	35	------	1.75	1.19	1.32
New Jersey	3,200	3,500	3,800	4,000	182	192	323	300	2.34	1.56	2.20	2.13
New York	4,920	6,980	8,070	6,940	492	510	646	923	1.58	1.65	1.33	1.86
Tennessee	------	460	500	500	------	21	25	28	------	1.60	1.87	2.17
Utah	------	------	200	200	------	------	30	25	------	------	1.95	2.40
Total	27,680	33,680	42,960	55,120	1,898	2,258	2,881	4,969	1.94	2.01	2.32	1.98

Bureau of Agricultural Economics estimates based upon returns from crop reporters.

[1] Average for season.
[2] 1-bushel hampers.
[3] Includes the fall crop moved in September, October, and November.

TABLE 198.—*Peas, green, for canning; commercial crop: Acreage, production, and price per ton, by States, 1924–1927*

State	Acreage				Production				Price per ton			
	1924	1925	1926	1927	1924	1925	1926	1927	1924	1925	1926	1927
	Acres	*Acres*	*Acres*	*Acres*	*Tons*	*Tons*	*Tons*	*Tons*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
California	5,200	4,890	2,680	750	3,700	3,400	3,200	1,000	70.00	63.75	65.00	60.00
Colorado	3,140	3,520	2,570	2,030	2,500	3,200	2,300	1,400	52.54	60.00	60.00	60.00
Delaware	2,500	2,500	2,000	1,500	2,500	2,000	1,000	2,200	67.50	70.88	75.00	60.00
Illinois	10,790	8,050	9,200	8,830	8,600	5,600	8,300	6,200	77.48	70.34	65.00	60.00
Indiana	6,190	4,320	6,000	1,440	6,200	3,500	5,400	1,200	46.32	53.57	52.05	57.46
Maine	1,030	1,770	1,410	690	900	1,600	600	600	70.00	70.00	70.00	70.00
Maryland	9,530	11,600	8,800	8,000	9,500	10,400	8,800	11,200	68.70	66.84	60.00	60.00
Michigan	12,220	13,010	14,430	8,400	9,800	6,500	11,500	5,900	50.65	50.69	50.00	55.00
Minnesota	5,200	7,880	8,570	6,500	5,200	4,700	3,400	5,200	47.60	47.52	53.79	45.00
New Jersey	500	280	350	500	600	200	400	600	64.00	67.00	61.00	65.00
New York	38,030	33,310	34,990	25,540	38,000	26,600	31,500	20,400	64.64	63.63	60.66	59.08
Ohio	5,830	4,850	4,210	2,990	5,800	2,400	2,900	2,400	60.00	62.00	63.62	61.87
Pennsylvania	1,280	1,690	1,400	1,320	1,300	800	1,300	1,800	60.00	60.00	58.89	58.00
Utah	10,360	10,750	9,510	8,460	12,400	17,200	12,400	10,200	57.75	56.05	58.27	53.84
Wisconsin	109,870	111,710	106,120	80,000	131,800	111,700	116,700	80,000	57.99	57.18	57.32	50.87
Other States	4,770	6,500	6,640	5,840	5,200	6,500	5,300	7,000	46.54	51.15	55.67	47.76
Total or average	226,590	226,630	218,880	162,790	244,000	206,300	215,000	157,300	59.40	58.54	58.01	56.69

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

TABLE 199.—*Peas: Car-lot shipments, by State of origin, 1925–1927*

State	Calendar year 1925	1926	1927[1]	State	Calendar year 1925	1926	1927[1]
	Cars	*Cars*	*Cars*		*Cars*	*Cars*	*Cars*
Alabama	------	------	1	New Jersey	20	27	40
Arizona	14	19	32	New Mexico	1	59	16
California, northern district	8	6	14	New York	885	1,110	976
California, southern district	7	------	16	North Carolina	491	596	569
California, central district	208	433	719	Oregon	6	------	13
California, Imperial Valley	346	364	615	South Carolina	104	167	205
Colorado	35	58	135	Tennessee	18	30	9
Florida	5	2	15	Texas	------	1	4
Georgia	------	2	------	Utah	2	13	20
Idaho	13	40	93	Virginia, Eastern Shore	75	44	26
Indiana	------	------	4	Virginia, Norfolk section	228	145	127
Kentucky	------	4	------	Virginia, other	------	99	106
Louisiana	1	------	------	Washington	43	64	110
Maryland, Eastern Shore	20	26	20				
Maryland, other	28	29	34	Total	2,707	3,571	4,162
Mississippi	149	233	243				

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car-lots include those by boat reduced to car-lot basis.

[1] Preliminary.

TABLE 200.—*Peas, canned: Pack[1] in the United States, 1917–1927*

State	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927
	1,000 cases	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*
New York	1,394	2,000	1,040	2,381	1,382	2,137	2,541	2,931	2,385	2,624	1,668
New Jersey[2]	755	332	248	549	345	153	199	331	257	143	267
Ohio	322	442	306	282	241	225	384	430	232	278	205
Indiana	604	454	381	271	182	268	367	483	86	500	90
Illinois	576	978	433	460	331	516	586	697	357	680	563
Michigan	523	477	425	549	317	455	392	710	451	723	399
Wisconsin	3,569	4,520	4,317	5,804	4,063	7,042	6,961	10,390	10,003	9,287	6,549
Minnesota[3]	------	------	------	------	------	------	254	470	432	446	497
Maryland	721	683	509	690	533	489	591	873	956	840	986
Utah	421	527	395	595	376	751	918	830	1,346	1,029	802
California	350	253	205	328	84	496	239	282	271	222	(4)
Other States	594	397	426	402	353	510	516	888	1,040	937	910
United States	9,829	11,063	8,685	12,317	8,207	13,042	13,948	19,315	17,816	17,709	12,936

Bureau of Agricultural Economics. Compiled from National Canners' Association data.

[1] Stated in cases of 24 No. 2 cans.
[2] Includes Delaware.
[3] Previous to 1923, included in "Other States."
[4] Included in "Other States."

TABLE 201.—*Peppers, commercial crop: Acreage, production, and price per bushel, by States, 1924–1927*

State	Acreage 1924	1925	1926	1927	Production 1924	1925	1926	1927	Price per bushel[1] 1924	1925	1926	1927
	Acres	*Acres*	*Acres*	*Acres*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
California	------	200	250	380	------	59	74	111	------	2.50	0.85	0.60
Florida	3,530	3,560	3,370	2,700	1,479	1,168	1,348	891	1.37	1.64	2.20	1.45
Louisiana	410	1,870	2,860	3,020	72	299	289	616	1.30	1.18	1.38	1.21
Mississippi	------	------	200	150	------	------	17	13	------	------	1.70	1.25
New Jersey	6,500	7,000	7,500	7,000	1,976	1,715	1,950	1,680	.88	1.00	.63	.75
North Carolina	330	650	650	620	69	130	124	81	1.57	1.62	1.25	.75
Texas	390	420	500	730	78	84	88	110	1.24	2.06	1.10	.80
Total	11,160	13,700	15,330	14,600	3,674	3,455	3,890	3,502	1.11	1.31	1.27	1.01

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

[1] Average for season.

TABLE 202.—*Potatoes: Acreage, production, value, exports, etc., United States, 1849, 1859, 1866–1927*

Year	Acreage	Average yield per acre	Production	Price per bushel received by producers Dec. 1	Farm value Dec. 1	Value per acre[1]	Wholesale price per bushel at New York[2]	Domestic exports, year beginning July 1[3]	Imports year beginning July 1[3]	Net balance, year beginning July 1[3][4]
	1,000 acres	*Bushels*	*1,000 bushels*	*Cents*	*1,000 dollars*	*Dollars*	*Cents*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
1849			*65,798*					156	173	−17
1859			*111,100*					380	[5] 750	−370
1866	1,069	100.2	107,201	47.3	50,723	47.45	85	512	198	+314
1867	1,192	82.0	97,783	65.9	64,462	54.08	135	379	210	+178
1868	1,132	93.8	106,090	59.3	62,919	55.58	84	508	138	+373
1869			*143,337*							
1869	1,222	109.5	133,886	42.9	57,481	47.04	67	597	75	+532
1870	1,325	86.6	114,775	65.0	74,621	56.32	106	553	459	+121
1871	1,221	98.7	120,462	53.9	64,905	53.16	66	622	96	+539
1872	1,331	85.3	113,516	53.5	60,692	45.60	86	515	347	+180
1873	1,295	81.9	106,089	65.2	69,154	53.40	91	497	549	−46
1874	1,310	80.9	105,981	61.5	65,223	49.79	70	610	180	+426
1875	1,510	110.5	166,877	34.4	57,358	37.99	39	704	92	+614
1876	1,742	71.7	124,827	61.9	77,320	44.39	113	530	3,206	−2,622
1877	1,792	94.9	170,092	43.7	74,272	41.45	53	744	529	+215
1878	1,777	69.9	124,127	58.7	72,924	41.04	84	625	2,624	−1,999
1879			*169,459*							
1879	1,837	98.9	181,626	43.6	79,154	43.09	45	696	722	−12
1880	1,843	91.0	167,660	48.3	81,062	43.98	65	639	2,170	−1,529
1881	2,042	53.5	109,145	91.0	99,291	48.62	108	408	8,790	−8,379
1882	2,172	78.7	170,973	55.7	95,305	43.88	77	439	2,362	−1,919
1883	2,280	90.9	208,164	42.2	87,849	38.38	41	555	425	+130
1884	2,221	85.8	190,642	39.6	75,524	34.00	48	381	659	−278
1885	2,266	77.2	175,029	44.7	78,153	34.49	55	495	1,937	−1,439
1886	2,287	73.5	168,051	46.7	78,442	34.30	59	435	1,432	−995
1887	2,357	56.9	134,103	68.2	91,507	38.82	72	404	8,260	−7,855
1888	2,533	79.9	202,365	40.2	81,414	32.14	38	472	883	−411
1889	*2,601*	*83.6*	*217,546*							
1889	2,601	77.4	201,200	35.4	71,294	27.41	57	407	3,416	−3,009
1890	2,653	56.7	150,494	75.3	113,291	42.70	101	341	5,402	−5,061
1891	2,732	93.7	256,122	35.6	91,229	33.39	41	557	187	+370
1892	2,650	62.1	164,516	65.5	107,835	40.69	73	846	4,317	−3,471
1893	2,722	71.7	195,040	58.4	113,886	41.84	63	803	3,003	−2,199
1894	2,891	63.6	183,841	52.9	97,330	33.67	58	573	1,342	−765
1895	3,101	102.3	317,114	26.2	83,151	26.81	24	680	175	+505
1896	2,975	91.4	271,769	29.0	78,783	26.48	36	927	246	+682
1897	2,813	67.9	191,025	54.2	103,442	36.77	72	605	1,171	−566
1898	2,841	77.0	218,772	41.5	90,807	31.99	52	580	530	+50
1899	*2,959*	*93.0*	*273,318*							
1899	2,939	88.6	260,257	39.7	103,365	35.17	50	809	156	+653
1900	2,987	82.9	247,759	42.3	104,764	35.07	53	741	372	+369
1901	2,996	66.3	198,626	76.3	151,602	50.60	70	528	7,656	−7,127
1902	3,078	95.5	293,918	46.9	137,730	44.75	65	843	359	+484
1903	3,080	85.1	262,053	60.9	159,620	51.82	89	484	3,167	−2,676
1904	3,172	111.1	352,268	44.8	157,646	49.70	43	1,163	181	+982
1905	3,195	87.3	278,885	61.1	170,340	53.31	73	1,000	1,948	−884
1906	3,244	102.2	331,685	50.6	167,795	51.72	57	1,530	177	+1,353
1907	3,375	95.7	322,954	61.3	197,863	58.63	75	1,204	404	+802
1908	3,503	86.2	302,000	69.7	210,618	60.13	83	764	8,384	−7,554
1909	*3,669*	*106.1*	*389,195*							
1909	3,669	107.5	394,553	54.2	213,679	58.24	40	999	353	+646
1910	3,720	93.8	349,032	55.7	194,566	52.30	54	2,384	219	+2,177
1911	3,619	80.9	292,737	79.9	233,778	64.60	106	1,237	13,735	−12,283
1912	3,711	113.4	420,647	50.5	212,550	57.28	62	2,028	337	+1,693
1913	3,668	90.4	331,525	68.7	227,903	62.13	78	1,794	3,646	−1,823
1914	3,711	110.5	409,921	48.7	199,460	53.75	47	3,135	271	+2,866
1915	3,734	96.3	359,721	61.7	221,992	59.45	103	4,018	210	+3,810
1916	3,565	80.5	286,953	146.1	419,333	117.62	238	2,480	3,079	−558
1917	4,384	100.8	442,108	122.8	542,774	123.81	129	3,453	1,180	+2,273
1918	4,295	95.9	411,860	119.3	491,527	114.44	127	3,689	3,534	+205
1919	*3,252*	*89.8*	*290,428*							
1919	3,542	91.2	322,867	159.5	514,855	145.36	284	3,723	6,941	−3,212
1920	3,657	110.3	403,296	114.5	461,778	126.27	103	4,803	3,423	+1,399

[1] Based on farm pric

[2] Compiled from Producers Price Current. Prices 1866–1919 are averages of the high and low weekly quotation of New Y potatoes, October–June, converted from dollars per 180 pounds to cents per bushel.

[3] Compiled from nmerce and Navigation of the United States, 1849, 1859, 1866–1917; Foreign Commerce and Navigati of the United States, 1918; Monthly Summary of Foreign Commerce of the United States, June issues, 919–1926, January and June issues, 1927.

[4] The difference between total exports (i. e., domestic exports plus reexports) and total imports; + indicates net exports, and − indicates net imports.

[5] Imports are estimates and based on the average import value per bushel in 1857, which amounted to $0.638.

TABLE 202.—*Potatoes: Acreage, production, value, exports, etc., United States, 1849, 1859, 1866–1927*—Continued

Year	Acreage	Average yield per acre	Production	Price per bushel received by producers Dec. 1	Farm value Dec. 1	Value per acre	Wholesale price per bushel at New York	Domestic exports, year beginning July 1	Imports year beginning July 1	Net balance, year beginning July 1
	1,000 acres	*Bushels*	*1,000 bushels*	*Cents*	*1,000 dollars*	*Dollars*	*Cents*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
1921	3,941	91.8	361,659	110.1	398,362	101.08	123	2,327	2,110	+222
1922	4,307	105.3	453,396	58.1	263,355	61.15	97	2,980	572	+2,408
1923	3,816	109.0	416,105	78.1	324,889	85.13	118	3,075	564	+2,512
1924	*2,911*	*121.1*	*352,462*							
1924	3,327	126.7	421,585	62.5	263,312	79.14	78	3,653	478	+3,187
1925	3,092	104.6	323,465	186.8	604,072	195.36	238	1,824	5,420	−3,575
1926	3,122	113.5	354,328	141.4	501,017	160.48	161	2,092	6,347	−4,203
1927 [6]	3,505	114.7	402,149	96.4	387,870	110.66				

Bureau of Agricultural Economics. Acreage, yield, and production figures are estimates of the crop-reporting board; italic figures are census returns. Prices received by producers are based upon returns from special price reporters.

[6] Preliminary.

TABLE 203.—*Potatoes, early and second early, commercial crop: Acreage, production, and price per bushel, by States, 1924–1927*

State	Acreage				Production				Price per bushel [1]			
	1924	1925	1926	1927	1924	1925	1926	1927	1924	1925	1926	1927
	Acres	*Acres*	*Acres*	*Acres*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Early:												
Alabama	12,500	8,940	12,750	13,200	1,412	715	982	1,109	0.90	1.20	1.78	1.37
California	11,000	11,850	14,980	17,800	1,012	1,635	2,097	1,744	1.34	1.19	1.23	1.08
Florida	28,000	21,920	23,070	28,000	2,184	2,718	2,722	2,940	2.14	1.74	3.04	1.84
Georgia	2,630	2,010	2,250	2,250	274	131	191	259	1.52	1.61	2.17	1.96
Louisiana	15,510	15,630	20,000	21,860	1,241	1,047	1,200	1,027	1.22	1.24	2.06	1.69
Mississippi	1,300	1,240	1,300	1,700	104	68	104	110	.92	1.54	1.77	1.27
North Carolina	26,000	22,100	29,000	35,000	3,640	2,144	3,480	4,200	.95	1.28	1.68	1.91
South Carolina	21,130	14,860	18,720	17,780	2,916	1,828	2,527	2,045	1.17	1.48	1.72	1.92
Texas	10,000	10,710	11,730	18,870	680	932	1,067	1,510	1.45	1.44	2.37	1.69
Virginia	100,520	90,050	89,000	78,700	15,983	9,185	9,345	14,087	.74	1.40	1.32	1.36
Total	228,590	199,310	222,800	235,160	29,446	20,403	23,715	29,031	.99	1.41	1.72	1.55
Second early:												
Arkansas	2,500	3,400	4,180	3,890	188	289	280	276	1.02	1.39	1.50	1.67
Kansas (Kaw Valley)	17,100	16,500	15,800	17,300	2,873	1,700	2,481	2,508	.63	1.26	.83	.85
Kentucky	5,680	5,620	5,620	5,340	841	601	584	662	.79	1.63	1.25	.94
Maryland	15,980	13,150	14,800	15,300	1,518	1,131	1,421	2,155	.58	1.43	.97	1.20
Missouri (Orrick district)	4,500	4,800	5,000	5,180	495	480	1,000	648	.65	1.41	.77	1.08
Nebraska (Kearney district)	2,000	1,500	1,200	1,700	150	172	132	255	.70	1.42	.75	.75
New Jersey	26,000	40,000	25,650	30,000	3,900	4,240	3,591	4,260	.81	1.35	1.37	.81
Oklahoma	9,900	14,500	14,400	14,940	792	1,450	1,411	1,539	1.09	1.20	1.52	2.00
Total	83,660	99,470	86,650	93,740	10,757	10,063	10,900	12,303	.74	1.34	1.15	1.07
Grand total	312,250	298,780	309,450	328,900	40,203	30,466	34,615	41,334	.92	1.39	1.54	1.41

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

[1] Average for season.

TABLE 204—*Potatoes: Acreage and production, by States, average 1921–1925, annual 1925–1927*

State	Acreage				Production			
	Average, 1921–1925	1925	1926	1927 [1]	Average, 1921–1925	1925	1926	1927 [1]
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
Maine	133	135	127	142	34, 895	33, 750	36, 830	32, 092
New Hampshire	13	11	11	12	1, 915	1, 595	1, 815	1, 800
Vermont	23	19	20	21	3, 425	2, 375	3, 100	3, 255
Massachusetts	22	14	13	14	2, 937	1, 960	2, 015	1, 400
Rhode Island	2	2	3	2	301	280	450	220
Connecticut	20	15	14	15	2, 645	2, 025	2, 170	1, 635
New York	313	270	248	270	35, 268	23, 220	29, 016	28, 620
New Jersey	78	55	50	57	9, 766	5, 830	7, 250	9, 177
Pennsylvania	233	202	198	220	24, 958	24, 846	22, 176	26, 400
Ohio	119	113	107	116	10, 401	11, 978	10, 058	12, 180
Indiana	64	50	48	53	5, 273	4, 150	3, 840	5, 035
Illinois	97	72	61	64	7, 168	4, 320	4, 880	5, 376
Michigan	302	237	249	289	31, 810	24, 411	29, 880	23, 120
Wisconsin	274	211	230	260	28, 659	23, 632	27, 140	23, 920
Minnesota	386	276	298	328	37, 668	26, 772	29, 800	33, 128
Iowa	85	83	74	78	7, 166	5, 229	5, 846	6, 396
Missouri	85	76	81	85	6, 424	4, 332	6, 480	7, 055
North Dakota	144	104	94	113	12, 531	7, 488	7, 520	11, 526
South Dakota	84	61	55	66	6, 304	3, 965	3, 300	7, 590
Nebraska	105	84	73	84	8, 552	6, 300	5, 320	8, 904
Kansas	59	54	43	49	4, 360	3, 618	3, 913	5, 390
Delaware	9	6	6	6	655	384	516	714
Maryland	45	37	39	43	3, 639	2, 701	3, 510	5, 246
Virginia	145	130	124	130	15, 371	11, 700	11, 656	19, 760
West Virginia	48	47	47	53	4, 635	4, 089	4, 982	5, 989
North Carolina	53	58	67	72	4, 753	4, 524	6, 325	7, 368
South Carolina	30	25	29	29	2, 817	2, 400	3, 219	3, 034
Georgia	21	17	19	17	1, 448	833	1, 197	1, 241
Florida	23	23	24	20	2, 315	2, 852	2, 832	3, 045
Kentucky	54	46	47	52	4, 196	2, 760	4, 512	4, 732
Tennessee	34	37	35	39	2, 426	2, 072	2, 730	3, 432
Alabama	35	25	29	33	2, 741	1, 425	2, 030	2, 475
Mississippi	14	11	12	12	1, 053	737	852	936
Arkansas	31	28	32	29	1, 949	1, 680	1, 920	1, 972
Louisiana	28	30	36	41	1, 781	1, 800	2, 196	2, 665
Oklahoma	38	39	43	45	2, 526	2, 808	2, 800	2, 925
Texas	32	26	30	35	1, 894	1, 378	2, 100	2, 310
Montana	38	35	35	40	4, 223	3, 780	2, 975	5, 400
Idaho	70	73	91	115	12, 849	14, 308	16, 198	24, 380
Wyoming	17	12	13	17	1, 789	1, 440	1, 456	2, 414
Colorado	107	80	84	113	14, 773	14, 640	11, 760	10, 046
New Mexico	3	2	2	2	160	150	166	150
Arizona	4	3	4	4	309	171	220	320
Utah	16	15	17	22	2, 712	2, 400	2, 465	2, 970
Nevada	4	4	5	6	707	680	700	780
Washington	57	56	67	79	8, 383	8, 680	10, 720	13, 430
Oregon	43	40	45	52	4, 239	4, 180	4, 500	6, 240
California	58	43	43	52	8, 460	6, 837	6, 923	7, 956
United States	3, 697	3, 092	3, 122	3, 505	395, 242	323, 465	354, 328	402, 149

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

[1] Preliminary.

TABLE 205.—*Potatoes: Yield per acre and estimated price per bushel, December 1, by States, average, 1914–1920, 1921–1925; annual, 1923–1927*

State	Yield per acre							Estimated price per bushel						
	Av., 1914–1920	Av., 1921–1925	1923	1924	1925	1926	1927	Av., 1914–1920	Av., 1921–1925	1923	1924	1925	1926	1927
	Bush.	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
Me.	196	262	258	315	250	290	226	109	89	70	43	200	133	85
N. H.	121	153	190	170	145	165	150	138	135	115	84	235	170	140
Vt.	121	151	200	160	125	155	156	118	119	100	85	215	140	125
Mass.	118	135	180	150	140	155	100	146	145	135	96	245	180	155
R. I.	118	130	165	140	140	150	110	148	144	130	95	245	180	155
Conn.	104	134	160	130	135	155	109	144	149	147	100	250	180	165
N. Y.	101	112	123	140	86	117	106	114	107	95	57	215	160	125
N. J.	117	124	95	150	106	145	161	128	124	110	67	230	155	110
Pa.	91	108	105	118	123	112	120	121	117	105	80	194	170	120
Ohio	79	88	98	88	106	94	105	132	127	100	89	200	170	120
Ind.	76	83	105	99	83	80	95	127	122	86	80	216	165	110
Ill.	72	76	92	110	60	80	84	134	126	88	75	235	175	115
Mich.	86	107	114	130	103	120	80	95	74	44	35	162	120	90
Wis.	98	106	96	130	112	118	92	88	76	47	36	170	120	85
Minn.	98	99	102	132	97	100	101	86	69	39	27	154	115	60
Iowa	79	86	84	136	63	79	82	124	115	77	55	235	170	100
Mo.	73	75	100	98	57	80	83	134	124	88	82	225	170	115
N. Dak.	82	86	83	90	72	80	102	94	65	35	39	150	120	50
S. Dak.	87	75	88	82	65	60	115	101	85	44	48	180	159	55
Nebr.	83	81	80	87	75	73	106	112	96	70	62	180	160	75
Kans.	70	75	86	95	67	91	110	136	130	99	91	235	170	100
Del.	91	76	80	90	64	86	119	109	112	102	80	200	140	80
Md.	92	80	80	83	73	90	122	103	109	100	81	194	140	105
Va.	107	106	93	131	90	94	152	110	108	87	82	195	140	130
W. Va.	96	97	120	95	87	106	113	129	129	105	98	193	167	125
N. C.	85	90	86	105	78	94	102	127	131	120	112	180	160	150
S. C.	87	94	103	111	96	111	105	171	159	160	145	210	170	190
Ga.	69	67	70	72	49	63	73	169	165	160	150	210	190	165
Fla.	87	101	92	88	124	118	105	178	196	190	165	260	300	185
Ky.	85	78	85	100	60	96	91	135	137	120	102	200	155	130
Tenn.	75	72	90	80	56	78	88	132	139	112	112	195	157	135
Ala.	78	76	80	90	57	70	75	163	169	150	155	220	190	150
Miss.	81	75	74	81	67	71	78	151	176	154	164	200	180	165
Ark.	71	63	59	74	60	60	68	155	157	136	128	210	185	150
La.	65	65	63	68	60	61	65	159	168	150	150	210	190	165
Okla.	66	67	66	70	72	67	65	161	158	128	130	225	170	180
Tex.	59	59	55	67	53	70	66	177	184	160	170	240	200	165
Mont.	117	109	110	88	108	85	135	97	86	65	87	160	120	65
Idaho	158	183	180	170	196	178	212	87	71	50	54	145	105	55
Wyo.	128	107	100	95	120	112	142	108	102	93	87	160	125	70
Colo.	137	142	123	140	183	140	142	97	76	53	60	155	130	55
N. Mex.	93	57	50	52	75	83	75	156	158	160	104	200	175	120
Ariz.	96	74	60	54	57	55	80	163	150	140	150	230	200	110
Utah	163	165	168	137	160	145	135	92	80	70	74	133	105	75
Nev.	163	159	174	131	170	140	130	117	116	105	106	190	130	85
Wash.	138	148	155	150	155	160	170	91	93	70	85	165	95	60
Oreg.	115	98	95	96	104	100	120	89	95	70	95	150	100	75
Calif.	138	148	150	162	159	161	153	125	121	112	90	200	132	95
U. S.	97.9	107.5	109.0	126.7	104.6	113.5	114.7	110.4	90.1	78.1	62.5	186.8	141.4	96.4

Bureau of Agricultural Economics. Yield figures are estimates of the crop-reporting board. Prices are based upon returns from special price reporters.

TABLE 206.—*Potatoes: Acreage, yield per acre and production in specified countries, average 1909–1913, annual 1924–1927*

Country	Acreage					Yield per acre					Production				
	Average, 1909–1913 [1]	1924	1925	1926	1927 preliminary	Average, 1909–1913 [1]	1924	1925	1926	1927 preliminary	Average, 1909–1913 [1]	1924	1925	1926	927 preliminary
NORTHERN HEMISPHERE	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
NORTH AMERICA															
Canada	483	562	546	523	572	161.2	168.0	129.4	155.1	139.6	77,843	94,413	70,633	81,137	79,879
United States	3,677	3,327	3,092	3,122	3,505	97.3	126.7	104.6	113.5	114.7	357,699	421,585	323,465	354,328	402,149
Mexico		32	32	36			38.4	43.4	43.9		[2] 540	1,229	1,358	1,579	
Total, United States and Canada	4,160	3,889	3,638	3,645	4,077	104.7	132.7	108.3	119.5	118.2	435,542	515,998	394,098	435,465	482,028
EUROPE															
United Kingdom:															
England and Wales	434	452	493	499	514	230.2	222.7	243.4	206.7	221.9	99,893	100,651	119,989	103,152	114,053
Scotland	144	138	142	142	147	240.8	228.6	261.6	236.4	202.9	34,674	31,547	37,147	33,563	29,829
North Ireland	558	157	154	153	153	203.9	197.1	283.1	260.8	257.9	119,874	30,943	43,596	39,902	39,462
Irish Free State		393	350	375	365		141.7	210.1	192.3			55,704	79,833	72,121	
Norway	102	117	117	119	123	242.9	183.9	294.9	276.2	192.7	24,780	21,517	34,500	32,870	23,696
Sweden	377	390	392	396	390	152.7	133.6	197.4	174.4	118.4	57,581	52,109	77,384	69,065	46,182
Denmark	161	177	186	189		202.7	154.1	259.0	157.8		32,642	27,271	48,167	29,827	19,107
Netherlands:															
For direct consumption	411	333	334	334	425	253.2	229.4	249.2	236.7	211.8	104,051	76,382	83,248	79,049	90,021
For starch manufacture		81	87	87			322.0	376.2	347.2			26,079	32,727	30,206	
Belgium	404	392	395	397	416	274.3	268.6	288.4	277.8	267.7	110,830	105,306	113,936	110,276	111,359
Luxemburg	36	38	39	39	33	178.9	167.7	186.2	109.8	164.9	6,439	6,372	7,262	4,281	6,265
France	4,066	3,615	3,619	3,611	3,595	129.6	156.0	154.3	113.3	161.7	526,793	564,020	558,316	409,193	629,964
Spain	[3] 642	779		769	756	[3] 176.0	114.6		151.2	172.5	[3] 112,997	89,267	102,700	116,292	130,399
Portugal				92					103.6			7,088	14,684	9,535	
Italy	739	860	855	870	877	88.9	83.7	94.0	97.6	80.9	67,514	71,943	80,383	84,914	70,914
Switzerland	[4] 115	110	110	118	119	214.5	180.4	247.2	189.9	206.9	[5] 24,664	19,840	27,190	22,413	24,618
Germany	6,775	6,821	6,941	6,819	6,916	202.7	196.1	220.8	161.8	199.5	1,373,609	1,337,540	1,532,872	1,103,420	1,379,712
Austria	436	414	435	439	436	112.4	146.2	174.7	108.6	192.0	53,373	60,524	76,001	47,685	83,724
Czechoslovakia	1,849	1,567	1,580	1,551	1,608	133.7	152.7	174.4	119.6	176.1	245,210	239,358	275,523	185,431	283,198
Hungary	619	612	644	620	626	114.9	92.2	131.8	111.1	106.1	71,118	56,406	84,859	68,879	66,403
Yugoslavia	458	539	570	548	573	101.1	70.0	78.9	63.0		46,288	37,753	44,966	34,539	
Malta	4	3	3	5	4	167.5	227.3	255.3	208.2	262.8	670	682	766	1,041	1,051
Greece	[2] 12					85.2					[2] 1,023		1,870	1,870	
Bulgaria	11	22	24	24	28	48.4	57.5	56.2	75.5	78.8	532	1,266	1,348	1,811	2,205

[1] Averages for countries having changed boundaries are estimates for present boundaries. [2] 1 year only. [3] 2-year avenue. [4] 3-year average. [5] 4-year average.

TABLE 206.—*Potatoes: Acreage, yield per acre and production in specified countries, average 1909–1913, annual 1924–1927*—Continued

Country	Acreage					Yield per acre					Production				
	Average, 1909–1913	1924	1925	1926	1927 preliminary	Average, 1909–1913	1924	1925	1926	1927 preliminary	Average, 1909–1913	1924	1925	1926	1927, preliminary
NORTHERN HEMISPHERE—Con.															
EUROPE—continued	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
Rumania:															
Grown alone	[5] 343	460	460	442	448	[5] 122.1	121.9	129.0	148.0		[5] 41,868	56,815	59,351	65,398	
Grown with corn	[5] 55	175	161	144			25.7	18.8	41.2		[5] 1,218	4,503	3,027	5,937	
Poland	5,693	5,760	5,829	5,834	5,959	156.2	171.4	183.5	156.7	195.8	889,531	987,279	1,069,457	914,123	1,166,638
Lithuania	403	436	403	362	343	101.4	139.7	144.2	169.0	130.2	40,864	60,926	58,095	61,170	44,658
Latvia	209	185	195	203	211	120.7	134.2	141.4	183.4	136.3	25,217	24,828	27,574	37,238	28,767
Estonia	190	166	170	172	176	144.9	149.5	140.4	197.8	146.8	27,526	24,817	23,872	34,020	25,835
Finland	[3] 181	166	167	171	172	101.9	140.4	159.1	182.9	133.4	18,443	23,300	26,570	31,270	22,947
Russia, European	6,780	9,923	10,648			104.0	108.5	146.0			705,432	1,076,253	1,555,055		
Total European countries reporting area and production, all years shown	23,218	22,678	22,974	22,812	23,423	163.8	171.7	189.3	151.9	181.5	3,803,312	3,892,692	4,349,019	3,465,070	4,252,039
Estimated European total, excluding Russia	25,470	25,400	25,800	25,600	26,200						4,164,600	4,204,000	4,747,000	3,840,000	4,617,000
AFRICA															
Algeria	44	45	49	66		42.0	63.5	65.4	41.4		1,847	2,858	3,203	2,730	
Tunis	(3)	3	3	2	2	(50.0)	47.0	54.0	77.0	51.5	(150)	141	162	154	103
Total	47	48	52	68		42.5	62.5	64.7	42.4		1,997	2,999	3,365	2,884	
ASIA															
Russia (Asiatic)	445	510	752			79.3	111.6	95.7			35,296	56,931	71,962		
Japanese Empire:															
Japan	169	230	238			146.4	139.8	150.3			24,738	32,153	35,782		
Chosen	[2] 65	180	185	187		107.1	78.3	87.5	87.8		[2] 6,960	14,093	16,191	16,416	
Great Lebanon		14	11	12	15		124.7	117.3				1,746	1,295		
Total Northern Hemisphere countries reporting area and production, all years shown	27,378	26,570	26,615	26,459	27,502	154.8	165.9	178.2	147.4	172.1	4,239,004	4,408,831	4,743,279	3,900,689	4,734,170
Estimated Northern Hemisphere total, excluding Russia and China	30,100	30,600	30,700	30,500	31,700						4,647,000	4,876,000	5,291,000	4,418,000	5,241,000

SOUTHERN HEMISPHERE															
Brazil		111	111	122			76.9	96.9	82.1			8,532	10,759	10,014	9,922
Chile	69	72	68	69		123.3	144.5	161.4	145.3		8,510	10,406	10,972	10,027	
Uruguay [5]		8	10				43.4	36.1				347	361		
Argentina	217	291	263	278		140.6	87.2	90.1	127.3		30,515	25,367	23,693	35,386	
Union of South Africa	[2] 62	91				[2] 49.5	56.9				[2] 3,071	5,181			
Madagascar	[4] 54	56	54	76	54	[4] 87.4	105.0	102.1	89.1	89.8	[4] 4,721	5,879	5,512	6,775	4,850
Australia	144	139	137			100.5	89.2	85.4			14,469	12,399	11,700		
New Zealand	28	23	23	25	22	205.8	198.3	233.4	174.4	201.1	5,763	4,561	5,368	4,359	4,424
Total Southern Hemisphere countries reporting area and production, all years shown through 1927	82	79	77	101	76	127.9	132.2	141.3	110.2	122.0	10,484	10,440	10,880	11,134	9,274
Estimated Southern Hemisphere, total	700	800	800	800							76,000	76,000	76,000	86,000	
Total Northern and Southern Hemisphere countries reporting area and production, all year shown through 1927	27,460	26,649	26,692	26,560	27,578	154.8	165.8	178.1	147.3	178.5	4,249,488	4,419,271	4,754,150	3,911,823	4,743,444
Estimated world total, excluding Russia and China	30,800	31,400	31,500	31,300							4,723,000	4,952,000	5,367,000	4,504,000	

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture. Estimates given are for crops harvested during the calendar year in the Northern Hemisphere and the succeeding harvest in the Southern Hemisphere.

[2] 1 year only. [3] 2-year average. 3-year average. [5] 4-year average.

TABLE 207.—*Potatoes: Car-lot shipments by State of origin, 1923–1927*

State and year	Crop movement season [1]																
	April	May	June	July	August	September	October	November	December	January	February	March	April	May	June	July	Total
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
Maine:																	
1923					293	3,959	5,780	3,645	3,025	4,321	3,878	4,103	3,143	2,087	528	2	34,764
1924					107	2,767	5,955	4,051	3,908	4,999	5,244	5,105	4,861	3,961	1,904	283	43,145
1925					1,206	4,549	5,835	3,030	3,110	4,227	3,791	5,068	2,830	3,349	1,793	42	38,830
1926 [2]					335	4,583	6,908	3,584	3,808	5,162	4,637	5,387	4,622	2,760	756	65	42,607
1927 [2]					467	3,039	6,709	4,184	3,952								
New York:																	
1923			6	65	1,866	1,716	2,346	1,903	1,070	1,771	1,839	2,321	2,135	1,406	185	5	18,634
1924				30	465	1,419	2,887	2,709	1,732	2,275	2,282	2,539	2,167	1,269	321	28	20,123
1925				582	1,694	1,670	2,355	700	854	819	820	1,174	646	259	24	1	11,598
1926 [2]				11	1,784	2,364	2,657	1,176	779	950	888	1,093	743	123	4	1	12,573
1927 [2]				31	1,554	2,360	2,703	1,360	693								
New Jersey:																	
1923				86	3,869	1,706	343	184	15	13	18	90	21	7			6,352
1924				42	4,213	3,635	530	76	26	14	19	70	11	1			8,637
1925				299	2,733	172	65	62	8		1	11	3	1			3,355
1926 [2]				106	3,456	971	45	130		2	2	27	11				4,750
1927 [2]				184	4,893	1,366	56	36	5								
Pennsylvania:																	
1923					31	178	584	884	288	534	393	428	468	259	45		4,092
1924				1	5	372	745	707	351	450	482	328	317	171	12	2	3,943
1925					101	1,034	1,937	998	541	535	282	347	184	63	5		6,027
1926 [2]					12	214	482	506	214	342	328	361	150	19			2,628
1927 [2]					28	538	787	570	195								
Michigan:																	
1923					46	896	2,490	2,587	1,292	1,823	2,201	2,567	2,917	2,657	1,065	14	20,555
1924					37	1,648	2,250	1,964	1,132	1,876	1,798	2,110	1,669	2,175	778	13	17,450
1925				5	949	1,927	2,955	1,258	931	901	1,009	1,164	993	1,423	680	6	14,201
1926 [2]					146	1,350	3,744	2,179	1,191	1,649	1,628	1,821	1,790	870	87		16,455
1927 [2]					27	300	787	754	707								
Wisconsin:																	
1923					189	1,295	2,633	1,481	1,102	1,956	2,209	2,014	1,917	1,728	605	8	17,137
1924					2	768	2,359	1,558	1,145	2,281	1,860	2,160	1,578	1,785	527	8	16,031
1925				2	676	2,263	3,284	1,560	1,210	1,836	1,338	1,782	968	749	355		16,025
1926 [2]				1	323	1,502	2,713	1,913	1,505	2,183	2,105	2,378	2,159	1,138	235	1	18,156
1927 [2]					297	1,672	2,156	1,272	1,001								

Minnesota:																	
1923				15	1,755	6,157	7,904	2,712	1,095	2,568	3,852	3,821	2,419	1,012	290	2	33,602
1924				29	571	2,659	8,785	3,672	1,214	3,096	3,828	4,176	1,946	1,362	555	2	31,695
1925				505	2,625	3,665	4,728	1,447	732	1,621	2,465	2,617	1,654	830	274		23,163
1926 [2]				6	1,002	2,595	6,710	1,908	861	1,780	2,890	3,681	2,177	1,257	181		25,048
1927 [2]				20	1,262	4,825	9,100	3,205	1,110								
North Dakota:																	
1923					19	1,829	4,160	754	239	514	801	1,214	705	113	35	1	10,384
1924					3	283	2,005	580	159	588	778	1,057	361	191	56		6,061
1925				2	15	945	1,826	309	118	267	374	644	263	42	7		4,812
1926 [2]					12	804	1,988	245	94	262	446	747	169	38	11		4,816
1927 [2]					6	1,146	3,242	520	120								
Nebraska:																	
1923				12	281	389	648	699	236	777	817	464	316	114	30		4,833
1924				6	175	314	414	275	207	633	455	269	95	64	11		2,918
1925				48	276	603	950	595	219	470	470	369	205	107	10		4,342
1926 [2]				2	195	497	772	477	262	468	295	181	54	25			3,228
1927 [2]					537	624	1,124	719	363								
Kansas:																	
1923				1,853	1,692	11		1	2		3	1		2			3,565
1924			35	2,520	1,845	337	53	3	1	1		1	1				4,797
1925			75	2,264	391	2	1				1		1				2,735
1926 [2]			5	2,296	1,734	16		8	2			1					4,062
1927 [2]			11	2,051	1,456	652	44	19									
Maryland:																	
1923			12	1,872	361	14	8	37	30	73	109	89	99	24			2,728
1924			7	1,579	774	78	37	21	22	16	60	53	30	2			2,679
1925			25	1,373	61	5	2	15	11	7	6	3	4				1,512
1926 [2]			9	1,631	288	11	4	17	8	7	22	15	18	1			2,031
1927 [2]			115	2,458	592	16	11	23	20								
Virginia:																	
1923			5,213	9,445	562	75	29	297	20	57	34	119	59	13			15,923
1924			3,810	15,229	3,495	549	157	144	110	20	9	55	20	10			23,608
1925			7,574	8,045	183	21	13	9	1	2	12	22					15,882
1926 [2]			4,122	11,413	538	84	12	23	3	1	3	12	1				16,212
1927 [2]			8,742	13,237	1,462	86	57	43	6								
North Carolina:																	
1923		14	3,141	215	71	19	4		1	12	1						3,478
1924	3	33	4,956	1,276	157	109	13	5	1	1	6	6	2				6,568
1925		521	3,253	206	57						2	1					4,040
1926 [2]		14	5,159	1,328	158	41	6	4		1	2						6,713
1927 [2]		219	6,756	437	25	33	5	2	1								
South Carolina:																	
1923		1,848	2,347	11	1			2		1							4,210
1924		1,527	3,666	68	4						1						5,266
1925		3,049	622	3													3,674
1926 [2]		1,253	3,940	25		1					1	3					5,223
1927 [2]		3,312	629					1									

[1] Crop movement season extends from Apr. 1 of one year through July of the following year, except in Florida, where the season begins in March.
[2] Preliminary.

TABLE 207.—*Potatoes: Car-lot shipments by State of origin, 1923–1927*—Continued

State and year	Crop movement season																
	April	May	June	July	August	September	October	November	December	January	February	March	April	May	June	July	Total
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
Florida:[3]																	
1923	1,089	2,291	108	3				1	2	1	4						3,499
1924	1,444	2,801	126	4					1	1							4,377
1925	3,296	1.828	9	1	1				1	1							5,137
1926 [2]	1,515	3,171	120	1					1	4							4,812
1927 [2]	3,787	1,600	47	7	1			1	20								
Alabama:																	
1923		517	863	3				1									1,384
1924		1,564	1,338	15						1		2					2,920
1925	2	977	66	1													1,046
1926 [2]		1,041	1,174	5		1						1					2,222
1927 [2]	27	1,833	228	10		1											
Louisiana:																	
1923		301	478	39				1	1	3	1	1					825
1924		751	614	55	4				1								1,425
1925	218	937	74	1													1,280
1926 [2]		673	729	17					7	3							1,429
1927 [2]	436	679	157					18	9								
Oklahoma:																	
1923			752	277				2		1	2						1,034
1924		1	1,022	153	2		3	11	1	27	42	1					1,263
1925		16	2,284	25	1	4	2	3									2,335
1926 [2]			1,755	351	3		1	15	15	12	10	2					2,164
1927 [2]		5	1,962	114	2		1	4	3								
Texas:[4]																	
1923	93	130	540	10	7				1	12	8						801
1924	232	476	675	14	1	2		1	5	18	1						1,425
1925	768	502	129			1	6	1	4	9	4						1,424
1926 [2]	757	822	407	9				2	10	12	5						2,024
1927 [2]	1,224	1,366	402	7				1	22								
Idaho:																	
1923				66	1,763	1,540	1,707	1,844	1,354	1,641	1,430	2,204	1,244	740	83		15,616
1924				128	667	1,373	1,750	1,400	1,025	1,766	1,141	1,369	1,155	134	34		11,942
1925				243	803	1,116	2,350	2,358	1,859	2,291	1,592	2,811	1,684	1,096	68		18,271
1926 [2]				159	907	2,042	3,238	1,978	2,012	1,910	1,709	2,046	1,165	148	15		17,329
1927 [2]				115	782	1,726	2,647	2,580	1,912								
Colorado:																	
1923				204	1,099	1,772	1,965	1,140	1,002	2,071	1,638	1,470	739	664	105		13,869
1924				207	598	2,080	1,968	1,493	913	1,883	1,354	855	566	448	21		12,386
1925			27	537	693	2,695	3,039	1,122	901	1,527	1,293	1,750	915	831	87		15,422
1926 [2]			20	325	1,103	3,071	2,537	1,083	982	1,449	1,358	1,396	791	82	3		14,200
1927 [2]				65	755	2,728	3,093	2,119	1,461								

Washington:																	
1923				140	133	231	803	1,000	427	754	652	1,030	693	154	143		6,160
1924				201	262	552	1,242	896	482	886	325	472	955	266	156		6,695
1925				286	411	843	1,442	1,686	351	758	705	1,286	830	527	454		8,979
1926 [2]				332	432	985	1,964	1,269	757	867	728	894	946	392	170		9,736
1927 [2]				271	335	887	1,315	1,124	545								
Oregon:																	
1923				33	350	81	88	203	110	126	200	165	214	42	3		1,615
1924				49	164	141	96	73	37	67	83	58	110	49			927
1925			6	51	136	12	167	437	98	67	68	211	194	36	11		1,494
1926 [2]				63	55	10	336	717	307	241	239	277	276	63	13		2,597
1927 [2]				26	64	39	191	359	227								
California:																	
1923		110	787	717	637	854	706	538	470	437	258	153	44	13			5,724
1924		98	549	784	823	956	738	709	635	532	343	210	125	36			6,588
1925		141	574	848	1,019	976	677	334	354	500	298	186	113	81			6,101
1926 [2]	1	336	1,382	765	946	1,031	736	539	452	412	263	103	108	59			7,133
1927 [2]	1	92	878	937	1,092	1,009	655	693	617								
Other States:																	
1923	1	100	527	1,384	1,702	1,341	3,026	821	145	296	368	577	758	222	75		11,343
1924		228	855	1,202	2,020	1,345	2,104	504	129	284	255	359	280	114	35		9,714
1925	2	156	870	2,102	828	1,064	1,997	962	221	347	301	468	520	119	14		9,971
1926 [3]		80	983	1,415	1,898	805	1,327	646	217	236	178	323	352	140	14		8,614
1927 [2]	3	467	671	953	2,009	1,398	2,971	719	217								

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis.

[2] Preliminary.
[3] Includes cars moved earlier as follows: 36 in March, 1923; 109 in March, 1924; 28 in February and 373 in March, 1925; 2 in February and 37 in March, 1926; 6 in February and 547 in March, 1927.
[4] Includes cars moved in March, as follows: 11 in 1925; 3 in 1926; 158 in 1927.

TABLE 208.—*Potatoes: Car-lot shipments by months, total for the United States, 1920–1927*

Origin and year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec	Total
United States:	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
1920	13, 752	9, 471	14, 612	9, 297	7, 043	14, 042	15, 317	14, 119	18, 875	32, 170	26, 067	10, 411	185, 176
1921	14, 477	12, 487	16, 449	14, 948	14, 926	16, 421	15, 606	16, 240	26, 322	42, 956	16, 729	10, 440	218, 001
1922	16, 721	13, 722	22, 334	20, 059	20, 284	22, 104	18, 833	18, 239	24, 420	35, 193	21, 050	12, 448	245, 407
1923	17, 261	14, 606	24, 462	23, 190	16, 300	20, 294	16, 733	16, 735	24, 044	35, 220	20, 732	11, 977	241, 554
1924	19, 762	20, 716	22, 940	19, 461	18, 736	20, 845	23, 624	16, 394	21, 387	34, 141	20, 852	13, 237	252, 095
1925	21, 715	20, 394	21, 639	20, 123	20, 215	19, 798	17, 765	14, 864	23, 569	33, 631	16, 286	11, 524	241, 523
1926	16, 185	14, 834	19, 974	14, 238	16, 903	23, 587	20, 310	15, 327	22, 978	36, 180	18, 419	13, 487	232, 422
1927 [1]	17, 953	17, 743	21, 454	20, 299	16, 688	22, 117	21, 050	17, 646	24, 445	37, 659	20, 326	13, 206	250, 586

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car-lots include those by boat reduced to car-lot basis.

[1] Preliminary.

TABLE 209.—*Potatoes: International trade, average 1911–1913, annual 1923–1926*

Country	Year ended Dec. 31									
	Average, 1911–1913		1923		1924		1925		1926, preliminary	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
PRINCIPAL EXPORTING COUNTRIES	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
Argentina	1, 337	543	81	1, 155	55	2, 557	281	1, 252	-------	1, 449
Belgium	4, 921	8, 692	3, 230	6, 513	2, 704	2, 814	4, 817	3, 782	4, 508	9, 374
Canada	525	1, 207	375	2, 976	940	3, 130	572	6, 281	467	8, 169
China	36	288	-------	201	-------	320	-------	109	-------	175
Czechoslovakia	-------	-------	358	2, 037	146	122	146	179	1, 216	37
Denmark	40	928	213	506	175	334	412	90	217	117
Estonia	-------	-------	2	537	-------	791	([1])	851	1	396
France	7, 143	8, 683	10, 880	8, 064	5, 841	10, 289	6, 795	10, 350	14, 388	8, 184
Hungary	-------	-------	131	1, 060	17	626	117	1, 238	82	4, 987
Italy	242	3, 975	39	6, 122	69	6, 791	212	7, 731	460	9, 421
Japan	-------	440	-------	321	-------	303	-------	474	-------	485
Netherlands	1, 952	16, 451	747	13, 399	506	15, 344	434	15, 552	404	18, 387
Poland	-------	-------	17	6, 068	33	10, 972	35	3, 535	4	4, 468
Russia	309	7, 762	-------	-------	[2] 7	[2] 61	[2] 15	[2] 20	-------	-------
Spain	-------	1, 835	1, 325	1, 624	481	1, 429	1, 248	1, 321	218	2, 227
PRINCIPAL IMPORTING COUNTRIES										
Algeria	1, 218	931	993	955	1, 305	1, 067	1, 313	1, 795	1, 165	1, 553
Austria	[3] 4,070	[3] 1,451	2, 979	94	1, 666	[2] 15	2, 215	[2] 33	3, 873	129
Brazil	939	([1])	59	1	1, 534	([1])	496	2	[2] 1,588	([1,2])
British India	-------	-------	1, 193	23	858	9	-------	-------	-------	-------
Cuba	2, 001	2	3, 992	-------	4, 860	3	4, 827	9	7	49
Egypt	599	[4] 28	763	53	765	68	841	77	827	77
Finland	479	15	1, 167	([1])	614	1	635	([1])	493	([1])
Germany	29, 180	12, 412	6, 394	743	10, 652	2, 317	14, 395	9, 774	15, 975	3, 565
Irish Free State	-------	-------	-------	-------	842	547	644	741	830	636
Norway	215	60	8	15	1	104	157	20	1	76
Philippine Islands	334	-------	322	-------	300	-------	322	-------	336	-------
Portugal	273	500	1, 362	[2] 29	661	[2,5] 20	[2] 1,396	[2] 155	-------	-------
Sweden	700	64	364	14	268	5	344	3	36	16
Switzerland	3, 172	42	1, 461	7	2, 930	4	2, 264	6	2, 615	4
Tunis	[6] 294	[6] 2	[2] 394	[2] 1	365	3	361	3	357	3
United Kingdom	11, 382	6, 246	9, 055	2, 412	16, 791	1, 531	18, 331	1, 614	12, 618	1, 937
United States	5, 707	1, 814	732	2, 696	452	3, 862	2, 433	2, 323	5, 728	2, 033
Uruguay	[4] 768	1	[7] 1,304	([1])	1, 234	[2] 1	[2] 1,536	([1])	[2] 1,631	[2] 1
Total 33 countries	77, 836	74, 372	49, 940	57, 626	57, 072	65, 440	67, 594	69, 389	70, 135	77, 955

Bureau of Agricultural Economics. Official sources except where otherwise noted.

[1] Less than 500 bushels.
[2] International Yearbook of Agricultural Statistics.
[3] Average for Austria-Hungary.
[4] 1 year only.
[5] 9 months.
[6] 2-year average.
[7] 11 months.

TABLE 210.—*Potatoes: Estimated price per bushel, received by producers, United States, 1909–1927*

Year beginning July	July 15	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	Weighted av.
	Cts.	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
Average:													
1909–1913	82.2	84.0	74.4	65.0	61.4	62.3	64.2	66.3	67.5	68.8	69.5	71.8	69.0
1914–1920	152.8	138.7	120.3	111.8	110.6	111.5	117.9	128.9	135.3	145.5	150.7	156.5	128.4
1921–1925	110.0	128.3	108.7	96.5	104.3	103.1	110.2	113.4	113.8	123.7	118.0	111.7	109.9
1909	88.0	78.3	67.9	61.0	56.0	55.0	56.1	55.4	51.0	42.9	37.9	38.8	57.9
1910	52.5	68.9	70.4	61.8	55.7	54.9	54.6	55.2	55.4	59.0	62.9	79.8	61.3
1911	116.2	124.8	101.0	82.3	78.1	82.2	89.4	98.2	109.6	122.2	123.5	111.6	99.6
1912	95.0	75.8	58.0	48.3	48.0	50.6	51.8	52.6	51.2	49.2	51.7	52.5	55.6
1913	59.5	72.2	74.6	71.8	69.2	68.6	69.0	70.2	70.4	70.7	71.4	76.4	70.6
1914	84.3	81.0	69.8	58.8	50.8	49.2	50.0	50.4	49.1	49.2	50.6	51.4	58.0
1915	54.2	53.4	40.6	54.8	61.2	66.2	79.3	91.2	96.0	96.2	96.8	100.6	70.8
1916	98.8	102.4	110.6	123.8	140.9	146.7	159.8	206.6	237.7	257.2	276.8	261.0	166.3
1917	209.4	155.0	130.6	125.0	125.3	121.9	122.0	121.6	106.4	86.4	77.8	85.2	122.5
1918	118.2	145.2	146.2	135.4	123.2	117.7	115.2	111.9	107.4	112.2	120.2	124.9	125.6
1919	160.6	190.2	175.8	158.5	156.2	169.0	198.1	230.6	269.6	344.6	407.4	403.6	223.8
1920	344.4	243.9	159.8	126.6	116.4	110.0	100.6	89.8	80.9	72.9	67.6	68.5	131.5
1921	103.4	152.8	153.1	130.6	116.8	109.4	112.0	116.6	115.7	109.0	104.2	103.7	121.3
1922	109.0	101.4	78.8	66.2	60.5	58.8	62.0	64.2	68.6	77.4	79.0	79.8	73.9
1923	102.9	120.8	109.6	91.4	82.5	81.5	86.4	88.1	87.8	91.1	91.3	100.7	94.2
1924	109.0	111.3	81.0	68.8	63.5	64.1	70.2	72.3	71.4	70.5	70.6	84.4	76.5
1925	125.5	155.4	121.1	125.6	198.4	201.5	220.5	226.0	225.6	270.5	244.8	190.1	183.5
1926	174.6	140.5	130.6	126.4	141.3	137.0	139.1	134.1	127.0	126.8	146.0	101.0	140.8
1927	183.1	146.3	107.4	97.9	95.4	94.1	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Based upon returns from special price reporters. Mean of prices reported on 1st of month and 1st of succeeding month, July, 1909–December, 1923.

TABLE 211.—*Potatoes: Shipping-point price, per 100 pounds in car lots, Minneapolis, 1919–1927* [1]

Year	Aug	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
		Dollars	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
1919		2.55	2.36	2.63	3.00	4.22	4.16	5.21	6.89	7.14	------
1920		[2] 1.98	1.57	1.82	1.34	1.14	.95	1.14	.85	.79	------
1921		1.95	1.72	1.47	1.45	1.73	1.58	1.43	1.32	1.41	1.62
1922		[2] .92	[2] .77	.69	.64	.62	.61	.86	1.08	.84	.69
1923		1.19	.86	.81	.85	1.12	1.08	1.04	1.15	1.09	1.48
1924		.77	.67	.68	.73	.90	.87	.84	.69	.99	1.28
1925		1.83	2.39	3.30	3.48	3.92	3.55	3.85	4.49	3.11	------
1926		2.20	2.19	2.21	2.09	2.08	1.81	1.78	1.91	2.96	3.98
1927		1.32	1.26	1.30	1.32	------	------	------	------	------	------

Bureau of Agricultural Economics. Compiled from daily market reports from bureau representative. Average prices as shown are based on stock of U. S. No. 1 grade; they are simple averages of daily range of selling prices.

[1] Minneapolis-St. Paul freight rate. [2] Field run and partly graded.

TABLE 212.—*Potatoes: Average l. c. l. price per 100 pounds, to jobbers, at three markets, 1919–1927*

Market, and season beginning April [1]	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
New York:	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1919	6.25	4.29	4.37	3.43	3.39	2.79	2.57	2.63	3.09	4.23	4.40	5.49	7.58	7.19
1920	------	9.03	6.93	5.54	2.56	1.83	1.93	1.96	1.82	1.80	1.31	1.51	1.28	1.22
1921	4.41	4.18	1.90	2.23	2.90	2.11	2.09	1.92	2.07	2.33	2.18	2.03	1.79	1.58
1922	4.07	3.27	3.03	1.81	1.04	.95	.96	1.22	1.36	1.39	1.44	1.87	2.09	1.76
1923	7.24	4.13	3.08	3.08	2.57	1.49	1.85	1.67	1.59	1.96	2.01	1.96	2.13	1.73
1924	5.92	4.12	2.34	1.48	1.41	1.37	1.33	1.22	1.26	1.40	1.56	1.21	1.20	1.36
1925	4.03	3.34	2.83	3.18	2.83	2.43	3.23	4.09	4.20	4.61	4.57	4.67	5.64	4.10
1926	8.84	6.29	3.78	2.29	2.38	2.57	2.89	2.99	2.92	2.80	2.48	2.45	2.46	3.61
1927	4.15	4.50	4.03	2.07	1.83	2.11	2.26	2.26	2.17	------	------	------	------	------
Chicago:														
1919	6.40	5.32	4.33	4.18	[2] 3.99	[2] 2.73	[2] 2.40	[2] 2.90	3.83	5.54	4.80	6.00	[2] 6.98	[2] 7.40
1920	------	9.14	8.38	[2] 6.44	[2] 3.42	[2] 2.40	[2] 1.85	[2] 2.13	[2] 1.58	[2] 1.29	[2] 1.15	[2] 1.25	[2] .98	[2] .87
1921	4.83	4.50	[2] 2.42	[2] 2.33	[2] 3.11	[2] 2.65	[2] 2.00	[2] 1.75	[2] 1.83	[2] 1.98	[2] 1.96	[2] 1.80	[2] 1.69	[2] 1.70
1922	4.16	3.57	[2] 3.03	[2] 2.29	[2] 1.63	[2] 1.17	[2] 1.00	[2] 1.05	[2] .96	[2] 1.02	[2] 1.07	[2] 1.35	[2] 1.53	[2] 1.13
1923	------	4.80	[2] 3.15	[2] 2.76	[2] 2.18	[2] 1.70	[2] 1.14	[2] 1.24	[2] 1.27	[2] 1.58	[2] 1.71	[2] 1.75	[2] 1.79	[2] 1.50
1924	5.68	4.69	2.65	[2] 1.76	[2] 1.40	[2] 1.32	[2] .97	[2] 1.31	[2] 1.36	[2] 1.47	[2] 1.63	[2] 1.44	[2] .84	[2] 1.18
1925	4.75	3.90	[2] 2.96	[2] 3.28	[2] 2.68	[2] 2.00	[2] 2.67	[2] 3.47	[2] 3.64	[2] 4.08	[2] 3.81	[2] 4.04	[2] 4.62	[2] 3.23
1926	8.59	6.57	[2] 3.91	[2] 2.35	[2] 2.22	[2] 2.45	[2] 2.49	[2] 2.65	[2] 2.47	[2] 2.55	[2] 2.37	[2] 2.42	[2] 2.68	[2] 3.51
1927	4.52	[2] 4.48	[2] 4.65	[2] 2.30	[2] 2.62	[2] 1.82	[2] 1.60	[2] 1.60	[2] 1.55	------	------	------	------	------
Boston:														
1919	------	5.00	4.64	4.19	3.76	2.54	2.26	2.67	3.06	4.12	4.39	5.23	6.25	7.08
1920	------	9.18	7.97	6.13	3.02	2.17	2.20	2.36	1.95	1.78	1.39	1.41	1.16	.94
1921	4.82	4.76	2.36	2.63	3.29	2.22	1.87	1.90	1.88	2.31	2.03	1.80	1.51	1.36
1922	4.80	3.86	3.54	2.33	1.48	1.20	1.20	1.38	1.31	1.44	1.47	1.76	2.18	1.98
1923	------	5.14	3.57	3.64	3.21	2.04	1.72	1.66	1.61	1.93	1.93	1.86	1.93	1.92
1924	6.03	5.37	2.72	1.90	1.59	1.41	1.12	1.09	1.12	1.28	1.47	1.12	.99	1.17
1925	4.46	3.81	3.21	3.68	3.60	2.01	3.04	4.12	4.17	4.66	4.46	4.62	5.79	4.13
1926	7.73	6.51	4.24	2.47	2.87	2.21	2.66	2.95	2.82	2.77	2.48	2.42	2.37	3.41
1927	4.43	4.80	4.53	2.28	2.11	2.46	1.94	2.03	1.93	------	------	------	------	------

Bureau of Agricultural Economics. Compiled from daily market reports from bureau representatives in the various markets. Average prices as shown are based on stock of U. S. No. 1 grade; they are simple averages of daily range of selling prices. In some cases conversions were made from larger to smaller units or vice versa, in order to obtain comparability.

[1] Crop movement season extends from April of one year through May of the following year, with irregular quotations continuing through June and July.
[2] Car-lot sales.

TABLE 213.—*Potatoes, "Maine" and "New York State:" Average l. c. l. price per bushel to jobbers at New York, 1909–1927*

Season beginning September	September	October	November	December	January	February	March	April	May
Average:	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1909–1913	67	64	66	68	73	73	73	78	77
1914–1920	------	118	124	128	147	152	155	175	170
1921–1925	118	111	122	126	140	141	141	153	127
1909	65	56	56	56	58	54	49	40	39
1910	55	55	51	49	52	49	47	62	57
1911	81	79	90	95	112	114	128	138	125
1912	60	59	64	68	63	67	62	66	77
1913	74	69	71	70	80	83	81	85	85
1914	62	56	54	51	51	48	47	50	46
1915	------	78	76	90	122	121	123	114	113
1916	118	125	169	161	198	267	267	300	318
1917	120	162	137	139	166	147	114	111	82
1918	158	144	137	150	142	126	111	143	149
1919	151	137	157	179	231	264	333	428	417
1920	------	125	138	127	116	88	88	78	66
1921	137	116	125	123	143	135	125	112	90
1922	86	78	82	86	93	96	121	125	110
1923	146	113	106	105	120	120	117	119	117
1924	91	72	70	73	82	94	73	71	76
1925	128	176	228	242	261	262	268	338	241
1926	140	162	171	170	161	146	142	143	216
1927	111	120	121	118	------	------	------	------	------

Bureau of Agricultural Economics. Compiled from Friday or Saturday issues, New York Producers' Price Current, average of weekly range.

In earlier years New York "State" quotations were included in the general term "State and Western." Earlier data are available in 1925 Yearbook, p. 928, Table 276.

TABLE 214.—*Spinach for consumption fresh, commercial crop; Acreage, production, price per bushel, by States, 1924–1927*

State	Acreage				Production				Price per bushel [1]			
	1923–24	1924–25	1925–26	1926–27	1923–24	1924–25	1925–26	1926–27	1923–24	1924–25	1925–26	1926–27
	Acres	*Acres*	*Acres*	*Acres*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
California	2, 130	1, 810	2, 290	1, 900	1, 836	905	1, 832	1, 520	0. 35	0. 29	0. 27	0. 30
Idaho			80	100			29	36			. 50	. 55
Louisiana		2, 470	5, 100	2, 280		679	1, 392	376		. 42	. 65	. 34
Maryland	2, 190	2, 300	2, 130	2, 130	1, 183	1, 150	479	1, 108	. 50	. 34	. 63	. 35
Missouri	820	1, 000	1, 200	1, 200	287	360	432	432	. 36	. 53	. 60	. 68
New Jersey	1, 300	1, 800	2, 600	2, 600	637	783	806	715	. 75	. 87	. 60	. 78
South Carolina	1, 500	1, 000	2, 000	900	384	480	632	164	. 50	1. 05	. 72	. 85
Texas	8, 700	14, 440	16, 820	19, 450	2, 740	4, 751	5, 130	6, 457	. 77	. 63	. 48	. 50
Virginia	8, 000	8, 500	8, 050	8, 130	3, 296	3. 060	1, 731	2, 715	. 89	. 67	. 73	. 61
Total	24, 640	33, 320	40, 270	38, 690	10, 363	12, 168	12, 463	13, 523	. 68	. 60	. 53	. 51

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

[1] Average for season, year beginning October.

TABLE 215.—*Spinach for canning, commercial crop: Acreage, production, and price per ton, by States, 1924–1927*

State	Acreage				Production				Price per ton			
	1924	1925	1926	1927	1924	1925	1926	1927	1924	1925	1926	1927
	Acres	*Acres*	*Acres*	*Acres*	*Tons*	*Tons*	*Tons*	*Tons*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
California	8, 290	9, 690	9, 590	10, 300	41, 400	29, 100	46, 000	51, 500	17. 61	17. 64	16. 15	14. 50
Maryland	1, 460	1, 500	1, 720	1, 420	4, 700	4, 500	3, 600	4, 500	48. 12	37. 50	30. 62	32. 80
Total or average	9, 750	11, 190	11, 310	11, 720	46, 100	33, 600	49, 600	56, 000	20. 72	20. 30	17. 20	15. 99

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

TABLE 216.—*Spinach: Car-lot shipments by State of origin, 1920–1927*

State	Crop movement [1]						
	1920–21	1921–22	1922–23	1923–24	1924–25	1925–26	1926–27 [2]
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
Missouri	126	57	28	84	152	86	38
Maryland	391	372	663	818	846	653	721
Virginia	2, 475	2, 212	3, 208	3, 105	2, 946	2, 669	3, 213
South Carolina		161	422	161	501	614	465
Texas	1, 463	1, 455	2, 433	3, 038	3, 235	4, 513	4, 495
California	149	302	473	70	241	295	455
Washington	19	13	9	22	47	160	96
Other States	45	119	117	320	204	181	206
Total	4, 668	4, 691	7, 353	7, 627	8, 172	9, 171	9, 689

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis.

[1] Crop movement season extends from September of one year through August of following year to correspond with production and acreage estimates.

[2] Preliminary.

TABLE 217.—*Sweet potatoes: Acreage, production, and value, United States, 1849, 1859, 1869, 1879, 1889, and 1899–1927*

Year	Acreage	Average yield per acre	Production	Price per bushel received by producers Dec. 1	Farm value Dec. 1	Value per acre [1]	Year	Acreage	Average yield per acre	Production	Price per bushel received by producers Dec. 1	Farm value Dec. 1	Value per acre [1]
	1,000 acres	*Bush.*	*1,000 bush.*	*Cents*	*1,000 dolls.*	*Dollars*		*1,000 acres*	*Bush.*	*1,000 bush.*	*Cents*	*1,000 dolls.*	*Dollars*
1849			*38,268*				1911	605	90.1	54,538	75.5	41,202	68.10
1859			*42,095*				1912	583	95.2	55,479	72.6	40,264	69.06
1869			*21,710*				1913	625	94.5	59,057	72.6	42,884	68.61
1879			*33,379*				1914	603	93.8	56,574	73.0	41,294	68.48
1889	*525*	*83.8*	*43,950*				1915	731	103.5	75,639	62.1	46,980	64.27
1899	*537*	*79.1*	*42,517*				1916	774	91.7	70,955	84.8	60,141	77.70
1899	537	77.5	41,593	53.0	22,065	41.09	1917	919	91.2	83,822	110.8	92,916	101.11
1900	544	88.9	48,346	50.6	24,478	45.09	1918	940	93.5	87,924	135.2	118,863	126.45
1901	547	81.7	44,697	57.5	25,720	47 02	1919	*804*	*97.2*	*78,092*			
1902	532	85.2	45,344	58.1	26,358	49.55	1919	941	103.2	97,126	134.4	130,514	138.70
1903	548	89.2	48,870	58.3	28,478	51.97	1920	992	104.8	103,925	113.4	117,834	118.78
1904	548	88.9	48,705	60.4	29,424	53.69	1921	1,066	92.5	98,654	88.1	86,894	81.51
1905	551	92.6	51,034	58.3	29,734	53.96	1922	1,117	97.9	100,394	77.1	84,295	75.47
1906	554	90.2	49,948	62.2	31,063	56.07	1923	993	97.9	97,177	97.9	95,091	95.76
1907	565	88.2	49,813	70.0	34,858	61.70	1924	*467*	*80.2*	*37,444*			
1908	599	92.4	55,352	66.1	36,564	61.04	1924	688	78.4	53,912	128.8	69,444	100.94
1909	*641*	*92.4*	*59,232*				1925	779	80.0	62,319	136.4	85,034	109.16
1909	641	90.1	57,764	68.5	39,585	61.76	1926	819	101.0	82,703	95.5	78,956	96.41
1910	641	93.5	59,938	67.1	40,216	62.74	1927 [2]	931	100.9	93,928	82.5	77,520	83.27

Bureau of Agricultural Economics. Acreage, yield, and production figures are estimates of the crop-reporting board; italic figures are census returns. Prices are based upon returns from special price reporters.

[1] Based on farm price Dec. 1. [2] Preliminary.

TABLE 218.—*Sweet potatoes: Acreage and production, by States, average 1921–1925, annual 1925–1927*

State	Acreage				Production			
	Average, 1921–1925	1925	1926	1927 [1]	Average, 1921-1925	1925	1926	1927 [1]
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*
New Jersey	17	16	17	15	2,308	1,872	2,465	1,890
Pennsylvania	2	1			204	115		
Ohio	3	3	3	3	320	345	315	399
Indiana	3	2	3	2	314	216	330	224
Illinois	9	12	13	10	920	1,056	1,430	1,030
Iowa	3	3	3	3	294	327	309	270
Missouri	12	10	10	12	1,218	950	1,120	1,344
Kansas	3	3	4	3	385	348	516	408
Delaware	9	8	9	8	1,083	880	1,251	880
Maryland	9	9	11	11	1,176	1,161	1,815	1,584
Virginia	41	37	43	43	4,773	3,996	5,375	5,805
West Virginia	3	3	3	3	349	276	330	330
North Carolina	94	80	84	89	9,526	7,040	7,560	10,146
South Carolina	77	52	47	53	6,566	2,860	3,760	5,300
Georgia	129	110	110	132	9,741	5,170	9,460	10,560
Florida	30	29	28	29	2,589	2,465	2,800	2,668
Kentucky	17	14	17	16	1,634	1,260	2,040	1,488
Tennessee	38	36	50	48	3,704	3,240	6,150	4,704
Alabama	103	65	65	75	9,204	4,550	6,500	7,350
Mississippi	86	62	55	69	7,681	5,952	5,720	7,728
Arkansas	41	36	34	38	3,695	3,060	3,672	4,408
Louisiana	77	72	79	99	6,374	5,760	7,110	9,702
Oklahoma	24	20	24	23	2,169	1,880	2,520	2,438
Texas	89	84	92	133	6,783	6,132	8,556	11,970
New Mexico	1	1	1	1	125	140	135	102
Arizona	2	2	2	1	255	260	300	120
California	7	9	12	12	820	1,008	1,164	1,080
United States	929	779	819	931	84,291	62,319	82,703	93,928

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

[1] Preliminary.

TABLE 219.—*Sweet potatoes: Yield per acre and estimated price per bushel, December 1, by States, average 1914–1920, 1921–1925, annual 1923–1927*

State	Yield per acre							Estimated price per bushel						
	Av., 1914–1920	Av., 1921–1925	1923	1924	1925	1926	1927	Av., 1914–1920	Av., 1921–1925	1923	1924	1925	1926	1927
	Bu.	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Bu.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
New Jersey	123	133	122	140	117	145	126	144	156	145	155	240	120	120
Pennsylvania	117	125	130	117	115	------	------	137	158	140	150	210	------	------
Ohio	100	110	112	95	115	105	133	155	167	150	163	210	150	140
Indiana	106	120	118	115	108	110	112	152	145	125	142	190	145	135
Illinois	94	102	110	108	88	110	103	134	127	110	139	190	135	115
Iowa	91	88	70	80	109	103	90	192	177	150	190	230	200	150
Missouri	96	100	103	100	95	112	112	142	121	108	125	165	130	120
Kansas	104	113	107	113	116	129	136	155	130	125	135	170	135	110
Delaware	125	122	112	130	110	139	110	95	118	115	126	190	65	70
Maryland	128	130	130	140	129	165	144	104	120	115	127	170	75	70
Virginia	118	116	120	120	108	125	135	105	111	105	110	130	100	85
West Virginia	117	116	130	110	92	110	110	146	162	148	141	200	160	140
North Carolina	103	100	105	92	88	90	114	98	100	98	104	120	100	80
South Carolina	94	81	97	68	55	80	100	104	100	86	104	147	100	80
Georgia	89	74	84	70	47	86	80	93	85	76	100	125	80	75
Florida	105	87	98	84	85	100	92	105	115	116	130	140	125	85
Kentucky	100	96	103	80	90	120	93	122	125	120	128	153	108	120
Tennessee	102	98	110	95	90	123	98	99	111	100	140	140	70	85
Alabama	91	86	104	73	70	100	98	88	96	83	125	125	85	85
Mississippi	94	86	98	51	96	104	112	86	101	91	173	100	95	80
Arkansas	103	89	95	81	85	108	116	97	103	92	127	125	95	80
Louisiana	88	81	90	50	80	90	98	89	99	95	158	115	90	70
Oklahoma	96	89	90	87	94	105	106	141	124	113	150	135	100	80
Texas	91	75	80	57	73	93	90	120	117	114	158	142	95	75
New Mexico	130	125	134	120	140	135	102	188	216	200	255	165	100	130
Arizona	153	140	170	125	130	150	120	204	203	210	238	210	155	200
California	150	110	115	94	112	97	90	129	149	165	218	170	110	115
United States	97.4	89.3	97.9	78.4	80.0	101.0	100.9	102.0	105.7	97.9	128.8	136.4	95.5	82.5

Bureau of Agricultural Economics. Yield figures are estimates of the crop-reporting board. Prices are based upon returns from special price reporters.

TABLE 220.—*Sweet potatoes: Car-lot shipments by State of origin, 1920–1926*

State	Crop movement season [1]						
	1920	1921	1922	1923	1924	1925	1926 [2]
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
New Jersey [3]	2,392	2,196	2,858	1,528	1,894	1,355	1,770
Delaware	1,877	1,722	2,632	1,549	1,750	1,742	1,885
Maryland	1,363	1,286	1,750	1,123	1,155	1,520	2,283
Virginia	4,830	5,300	6,633	5,374	5,213	4,750	6,501
North Carolina [3]	823	1,022	679	563	816	1,510	1,668
South Carolina	56	135	235	155	120	231	162
Georgia	1,030	1,400	781	610	1,018	674	680
Florida	95	110	[4] 128	59	175	241	185
Tennessee [3]	924	1,578	1,495	726	1,137	2,592	4,972
Alabama	579	591	637	382	649	663	515
Mississippi	93	181	116	61	36	156	79
Arkansas [3]	568	584	240	263	371	476	548
Louisiana [3]	772	893	1,033	463	558	2,342	1,285
Oklahoma	91	147	85	110	107	216	287
Texas	632	759	974	535	221	485	698
California	856	1,000	982	684	466	1,161	1,187
Other States [3]	216	479	408	345	381	745	1,053
Total [3]	17,206	19,383	[4] 21,566	14,530	16,067	20,859	25,738

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis.

[1] Crop movement season extends from July 1 of one year through June of the following year.

[2] Preliminary.

[3] Figures for certain States include shipments in July of succeeding crop year as follows: New Jersey—1920, 15 cars; 1922, 4 cars. Arkansas—1921, 1 car; 1926, 1 car. Kentucky—1921, 1 car; 1926, 12 cars. New Mexico—1921, 5 cars. Tennessee—1921, 17 cars; 1924, 3 cars; 1925, 11 cars; 1926, 309 cars. North Carolina—1926, 3 cars. Indiana—1926, 1 car. Louisiana—1926, 1 car; and for August, Tennessee—19 cars in 1926.

[4] Florida includes 2 cars in June, 1922.

TABLE 221.—*Sweet potatoes: Estimated price per bushel, received by producers, United States, 1910–1927*

Year beginning July	July 15	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	Weighted av.
Average:	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
1910–1913	95.0	97.9	89.0	79.8	72.8	75.7	83.0	87.0	92.0	99.6	102.0	97.1	85.1
1914–1920	128.9	139.8	129.6	111.7	101.4	102.4	112.1	118.0	128.2	138.8	139.8	137.3	118.8
1921–1925	141.6	156.1	138.4	124.7	109.2	113.1	120.4	130.0	130.1	147.4	149.1	147.2	129.7
1910	73.5	82.9	79.5	75.7	67.8	70.9	79.1	81.6	87.3	95.0	103.6	93.8	78.7
1911	104.1	107.4	97.9	85.6	76.2	79.0	86.9	93.5	102.4	117.4	118.6	111.4	92.2
1912	113.0	102.5	88.9	79.9	73.7	77.2	83.7	87.0	90.8	94.3	93.2	90.8	85.6
1913	89.4	98.8	89.8	78.0	73.4	75.8	82.5	86.1	87.3	91.9	92.7	92.5	84.0
1914	94.5	98.4	90.1	79.3	72.3	74.9	81.0	85.0	90.8	100.8	98.1	97.6	84.6
1915	93.1	97.2	80.0	69.7	62.9	65.0	72.7	76.4	80.1	81.0	78.9	83.9	75.4
1916	87.5	99.0	88.1	80.3	80.3	86.4	92.9	100.0	115.5	126.0	132.0	135.8	92.9
1917	124.4	126.3	120.3	110.5	105.6	110.8	123.1	129.8	149.2	158.1	158.2	134.0	122.3
1918	142.1	151.6	164.3	152.4	137.4	131.8	137.8	149.2	157.2	176.2	174.4	162.7	150.0
1919	159.7	195.4	174.6	150.9	135.1	135.6	151.1	163.6	179.2	193.9	199.7	205.2	161.7
1920	200.7	210.8	190.0	138.7	116.5	112.3	126.3	122.1	125.5	135.7	136.8	141.9	144.8
1921	151.2	154.2	118.2	104.0	91.5	95.3	102.3	106.9	114.3	116.0	117.1	120.7	110.9
1922	125.3	127.5	106.0	90.4	79.0	84.8	92.5	96.9	100.1	103.8	107.9	107.4	97.4
1923	112.1	151.3	133.6	114.8	101.0	103.8	112.5	123.7	129.0	140.4	139.2	138.9	121.7
1924	130.7	151.4	157.0	145.1	130.3	140.1	145.5	160.2	180.8	196.2	189.1	170.2	152.4
1925	188.7	196.3	177.4	169.4	144.4	141.5	149.3	162.4	171.4	180.4	192.2	198.8	165.9
1926	185.6	189.0	153.9	110.6	88.5	94.0	97.8	109.0	112.3	112.8	118.9	136.0	120.3
1927	136.4	146.7	121.9	98.1	86.5	91.9							

Bureau of Agricultural Economics. Based upon returns from special price reporters.

TABLE 222.—*Sweet potatoes: Average l. c. l. price per bushel to jobbers at three markets, 1920–1927*

Market, and season beginning August	August[1]	September[1]	October	November	December	January	February	March	April[2]	May[2]
New York:	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
1920	2.70	1.76	1.36	1.23	1.56	1.76	1.82	2.40	2.32	2.73
1921	1.51	1.48	1.26	1.36	1.67	2.02	1.93	1.92	2.27	2.23
1922		1.00	.70	.73	.96	1.03	1.01	.94	1.39	
1923		1.16	1.20	1.95	2.51	2.94	3.38	3.02	3.98	
1924		1.98	1.47	1.88	2.47	2.75	2.74	2.63		
1925	1.53	1.70	1.68	1.70	2.23	2.61	2.59	2.96	3.42	
1926	2.21	1.47	.97	.98	1.24	1.37	1.46	1.61	1.81	2.09
1927	1.31	1.13	.93	1.29	1.48					
Chicago:										
1920	2.61	2.05	1.85	1.96	2.21	2.20	2.29	2.35	2.40	2.13
1921	2.01	1.70	1.57	1.48	1.65	1.81	1.89	1.93	1.69	1.29
1922		1.44	1.00	1.22	1.26	1.43	1.44	1.47	1.62	
1923		1.67	1.52	2.03	2.73	3.09	3.31	3.76	4.04	
1924		2.29	1.88	2.33	2.80	2.92	3.26	2.94		
1925	2.04	2.04	2.02	2.25	2.42	2.37	2.29	2.40	2.98	
1926	2.23	1.72	1.30	1.37	1.69	1.70	1.66	1.52	1.23	1.44
1927	1.54	1.55	1.39	1.44	[3] 1.68					
St. Louis:										
1920	2.25	1.66	1.16	1.61	1.40	1.68	1.85	1.78	1.81	1.84
1921	1.23	1.09	.94		1.11	1.20	1.10	1.18	1.04	
1922		.87	.84	.92	.98	1.03	.97	.98	1.12	
1923				1.49	1.97	2.23	2.29	3.00	3.25	
1924		2.17		2.03	2.16	2.54	2.56	2.61		
1925	1.56	1.43	1.38	1.57	1.90	[3] 1.87	[3] 1.66	[3] 1.74	[3] 2.00	
1926	2.12	1.12	.94	.98	1.12	[3] 1.31	.99	1.01	.99	
1927	1.06	.88	.87	1.21	1.18					

Bureau of Agricultural Economics. Compiled from daily market reports from bureau representatives in the various markets.

Average prices as shown are based on stock of good merchantable quality and condition; they are simple averages of daily range of selling prices. In some cases conversions have been made from larger to smaller units or vice versa, in order to obtain comparability.

[1] Commodity reports began Aug. 23, 1920 and 1921; Sept. 1, 1922; Sept. 18, 1923; Sept. 2, 1924; Aug. 25, 1925; Aug. 16, 1926; Aug. 19, 1927.
[2] Last commodity report of season May 26, 1921 and 1922; May 4, 1923; Apr. 15, 1924; Apr. 3, 1925; Apr. 16, 1926; Apr. 19, 1927. Subsequent prices for 1927, taken from miscellaneous reports.
[3] Kiln-dried.

TABLE 223.—*Tomatoes for consumption fresh, commercial crop: Acreage production, and price per bushel, by States, 1924–1927*

State	Acreage				Production				Price per bushel [1]			
	1924	1925	1926	1927	1924	1925	1926	1927	1924	1925	1926	1927
Early:	*Acres*	*Acres*	*Acres*	*Acres*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
California (Imperial)	600	860	1,000	1,200	90	64	113	161	4.53	3.04	3.05	2.00
Florida	50,070	33,470	20,700	29,800	3,956	2,811	1,946	3,606	3.09	3.15	4.35	2.02
Georgia	2,000	1,040	1,850	2,090	66	74	111	163	1.43	2.55	2.50	1.36
Louisiana	-------	1,020	1,690	2,180	------	102	128	196	------	2.99	1.81	1.00
Mississippi	15,300	11,100	14,200	15,360	1,683	1,310	1,406	2,765	1.99	3.25	3.28	2.01
South Carolina	2,220	2,650	3,450	2,050	202	217	386	164	1.74	2.40	3.33	1.51
Texas [2]	9,460	10,780	13,930	16,800	870	884	1,337	1,596	2.54	2.74	2.86	1.76
Total	79,650	60,920	56,820	69,480	6,867	5,462	5,427	8,651	2.71	3.07	3.51	1.92
Intermediate:												
Arkansas	-------	480	1,180	2,730	------	43	132	303	------	3.26	1.26	2.24
Illinois (Union Co.)	830	2,000	1,300	940	108	168	65	150	1.71	1.74	1.18	2.04
New Jersey	13,000	14,000	12,000	11,400	3,016	3,500	2,520	2,508	1.92	.85	.95	1.10
Ohio (Wash. Co.)	800	810	920	920	170	188	166	222	2.23	3.54	1.69	1.35
Tennessee	2,690	5,000	8,000	6,500	336	635	936	838	2.62	2.88	1.99	2.76
Total	1,7320	22,290	23,400	22,490	3,630	4,534	3,819	4,021	1.90	1.30	1.25	1.58
Late:												
California (except Imperial)	10,900	11,300	12,090	21,550	1,406	2,418	2,007	1,530	2.36	1.09	1.19	1.16
Colorado	350	580	410	250	80	176	110	44	1.13	1.20	.76	.85
Delaware	380	300	200	180	50	74	20	36	.70	.65	1.00	.75
Ill. (except Union Co.)	4,000	3,280	2,200	2,750	856	797	396	432	2.17	2.46	.99	1.51
Indiana	6,560	7,480	4,350	4,780	866	1,414	592	650	.97	1.89	.67	.60
Iowa	620	410	570	450	75	59	67	72	1.19	1.20	.50	.51
Kentucky	4,130	4,090	1,040	1,630	735	585	115	186	1.10	1.37	1.39	1.18
Maryland	7,620	3,180	3,220	7,050	952	566	206	1,107	1.58	.89	.91	.80
Michigan	580	800	290	290	124	184	51	57	1.64	1.35	1.33	.91
Missouri	6,750	6,910	1,080	4,480	648	864	89	318	1.82	1.38	.86	.61
New York	2,920	2,380	1,740	2,640	835	595	311	631	.95	1.25	.85	.56
Ohio (except Wash. Co.)	6,000	2,850	890	1,110	1,242	712	152	179	1.45	1.26	1.16	.78
Pennsylvania	1,350	2,570	370	420	251	550	40	75	1.25	.81	.59	.60
Utah	-------	400	700	500	------	140	105	166	------	1.20	.75	.78
Virginia	1,390	3,030	1,500	1,200	259	491	188	150	1.42	.71	.63	2.25
Total	53,550	50,610	30,710	49,280	8,379	9,625	4,449	5,633	1.58	1.50	1.00	.94
Grand total	150,520	133,820	110,930	141,250	18,876	19,621	13,695	18,305	2.07	1.89	2.07	1.54

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

[1] Average for season. [2] Includes fall crop of previous year.

TABLE 224.—*Tomatoes for manufacture, commercial crop: Acreage, production, and price per ton, by States, 1924–1927*

State	Acreage				Production				Price per ton			
	1924	1925	1926	1927	1924	1925	1926	1927	1924	1925	1926	1927
	Acres	*Acres*	*Acres*	*Acres*	*Tons*	*Tons*	*Tons*	*Tons*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
Arkansas	13,400	20,340	11,630	11,510	53,600	61,000	29,100	34,500	12.50	13.65	11.86	12.76
California	26,000	30,000	32,250	28,760	148,200	180,000	206,400	178,300	16.84	16.29	15.61	15.00
Colorado	2,000	3,010	2,350	2,250	14,400	25,800	17,600	11,200	10.25	11.50	12.00	12.00
Delaware	18,000	20,000	11,700	15,000	54,000	106,000	23,400	76,500	18.30	16.27	20.00	14.00
Illinois	6,000	7,650	5,270	5,110	25,200	29,100	21,100	22,500	13.72	12.33	13.44	13.08
Indiana	59,000	67,340	49,990	42,990	200,600	303,000	175,000	163,400	12.41	12.79	12.60	13.06
Iowa	3,500	3,660	3,850	4,080	9,800	13,500	12,700	18,400	12.80	14.55	12.88	14.29
Kentucky	6,200	9,550	6,950	6,530	24,800	38,200	20,800	20,900	13.48	13.46	12.25	13.08
Maryland	45,270	49,800	37,000	34,410	149,400	249,000	88,800	151,400	19.50	15.97	13.90	14.28
Michigan	2,300	2,000	1,800	1,800	13,100	13,600	9,000	9,900	10.29	11.91	11.80	12.13
Missouri	27,000	39,150	25,620	17,920	67,500	137,000	64,000	35,900	13.05	13.52	11.85	12.87
New Jersey	30,000	32,000	32,000	28,000	150,000	224,000	153,600	145,600	20.36	17.00	20.40	18.00
New York	11,700	13,550	9,850	10,540	74,900	92,100	49,200	70,600	16.08	16.31	15.30	14.92
Ohio	9,000	8,560	8,000	10,000	48,600	51,400	38,400	45,000	11.57	13.09	11.20	12.45
Pennsylvania	2,500	4,780	3,370	3,740	11,500	25,800	10,100	18,700	14.98	16.00	13.40	14.24
Tennessee	8,500	11,820	8,200	8,450	28,400	23,600	24,000	.24,500	13.99	15.39	13.42	13.95
Utah	4,800	6,860	2,630	5,200	30,700	123,500	18,400	48,400	10.00	11.98	10.00	11.00
Virginia	12,500	15,730	6,000	6,420	45,000	55,100	21,000	25,700	16.22	16.19	12.73	13.75
Other States	3,600	4,100	3,040	3,310	10,800	20,500	9,100	7,600	15.00	15.24	13.60	14.43
Total or average	291,270	349,030	261,500	246,030	1,158,500	1,772,200	992,300	1,109,000	15.61	14.77	14.72	14.32

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

TABLE 225.—*Tomatoes: Car-lot shipments by State of origin, 1920–1927*

State	1920	1921	1922	1923	1924	1925	1926	1927 [1]
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
New York	1,945	1,073	1,902	1,261	954	1,024	656	888
New Jersey	2,798	2,121	1,930	1,618	2,150	1,907	2,006	1,310
Ohio	450	411	558	956	1,035	1,286	1,065	1,112
Indiana	1,265	552	1,332	1,185	1,479	1,889	1,514	1,122
Illinois	450	155	220	250	230	539	422	223
Maryland	194	110	242	271	66	313	259	579
Virginia	188	91	83	43	167	379	454	354
South Carolina	-------	59	145	431	421	508	449	189
Georgia	1	4	23	18	176	85	169	82
Florida [2]	4,192	5,785	10,245	9,760	9,140	7,188	4,351	9,709
Kentucky	468	341	153	121	546	498	300	198
Arkansas	11	23	47	9	38	104	281	234
Tennessee	805	370	920	501	985	1,393	2,374	2,020
Mississippi	1,393	1,945	3,441	2,144	3,776	3,149	3,492	4,849
Texas [3]	1,393	2,025	1,893	1,084	1,694	2,398	2,890	3,384
Utah	261	100	378	369	380	1,457	272	805
California [3]	2,004	1,819	2,349	3,293	2,789	2,961	4,443	4,502
Other States	576	431	847	620	804	1,116	674	621
Total [2] [3]	18,394	17,415	26,717	23,964	26,830	28,254	26,071	32,181

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis.

[1] Preliminary.
[2] Figures for Florida include cars moved in preceding calendar year as follows: 1920, 14 cars in November, 34 cars in December; 1922, 10 cars in December; 1923, 26 cars in December; 1924, 2 cars in November, 55 cars in December; 1925, 14 cars in November, 31 cars in December; 1926, 7 cars in November, 13 cars in December; 1927, 1 car in December.
[3] Figures include cars in following calendar year as follows: California, 1922, 3 cars in January; 1924, 1 car in January; 1925, 1 car in January; 1926, 3 cars in February. Texas, 1922, 5 cars in January, and 2 cars in February; 1925, 8 cars in January; 1926, 15 cars in January.

TABLE 226.—*Tomatoes, canned: Pack [1] in the United States, 1917–1927*

State [4]	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	
	1,000 cases	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*
New York	553	396	437	515	214	340	266	325	389	302	300
New Jersey	380	667	60	517	116	337	412	186	418	204	277
Pennsylvania	[2] 488	[2] 441	[2] 384	[2] 680	[2] 186	[2] 644	258	150	338	118	167
Ohio	107	357	172	142	71	179	174	133	179	120	189
Indiana	398	968	876	778	530	1,312	717	1,050	1,955	900	1,131
Missouri	704	353	439	715	136	775	839	871	1,836	895	605
Delaware	1,381	879	189	553	176	590	1,216	803	1,272	228	827
Maryland	5,934	6,049	2,529	3,347	1,656	3,205	5,722	3,825	6,175	1,901	3,671
Virginia [3]	1,170	1,547	953	1,162	217	891	963	1,116	1,138	572	1,059
Kentucky [2]	-------	-------	-------	-------	-------	-------	59	136	275	223	253
Tennessee [2]	-------	-------	-------	-------	-------	-------	170	380	382	280	368
Arkansas [4]	-------	-------	-------	-------	-------	-------	270	768	1,168	558	678
Colorado [5]	213	306	290	218	62	168	182	180	309	183	127
Utah	513	953	594	444	132	664	584	417	1,353	235	792
California	2,603	1,790	3,052	1,773	339	1,701	2,397	1,767	1,839	2,347	2,257
Other States	632	576	835	524	182	732	437	406	744	389	459
United States	15,076	15,882	10,810	11,368	4,017	11,538	14,672	12,519	19,770	9,455	13,160

Bureau of Agricultural Economics. Compiled from National Canners' Association data.

[1] Stated in cases of 24 No. 3 cans.
[2] Previous to 1923, Pennsylvania, Kentucky, and Tennessee composed one group.
[3] Includes West Virginia.
[4] Previous to 1923, included in "Other States."
[5] Includes Washington.

TABLE 227.—*Watermelons, commercial crop: Acreage, production, and price per car, by States, 1924–1927*

State	Acreage				Production				Price per car [1]			
	1924	1925	1926	1927	1924	1925	1926	1927	1924	1925	1926	1927
Early:	*Acres*	*Acres*	*Acres*	*Acres*	*Cars* [2]	*Cars* [2]	*Cars* [2]	*Cars* [2]	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Alabama	10, 940	10, 030	11, 030	9, 820	3, 173	2, 618	3, 254	2, 946	207	188	93	175
Arizona	1, 230	1, 100	1, 200	1, 200	184	352	402	420	247	200	156	287
California (Imperial)	3, 800	4, 000	6, 000	5, 500	2, 280	3, 000	4, 560	3, 597	233	250	100	120
Florida	28, 280	22, 100	24, 150	29, 420	6, 929	8, 288	10, 843	8, 826	247	408	255	286
Georgia	45, 890	45, 890	53, 600	54, 060	16, 750	15, 878	20, 958	17, 570	118	244	121	161
Mississippi	800	810	1, 240	1, 300	212	304	217	390	152	223	89	140
North Carolina	6, 420	4, 100	4, 880	5, 610	963	1, 304	1. 484	2, 014	144	196	77	149
South Carolina	15, 070	11, 010	12, 720	12, 470	6, 706	4, 668	5, 215	4, 240	72	166	88	168
Texas	30, 800	32, 020	34, 900	29, 600	6, 930	5, 036	6, 980	8, 156	178	228	222	165
Late:												
Arkansas	950	1, 480	2, 700	2, 200	380	432	540	594	165	226	121	186
California (other)	8, 040	6, 370	6, 820	4, 280	3, 851	2, 548	3, 008	1, 644	161	197	112	139
Colorado	380	300	300	320	114	97	108	40	128	168	95	242
Delaware	1, 000	1, 900	2, 000	980	280	697	800	98	178	116	105	105
Illinois	3, 120	2, 820	3, 200	2, 880	780	818	816	734	109	159	86	269
Indiana	3, 540	3, 440	3, 440	2, 720	1, 062	1, 204	980	778	216	172	118	350
Iowa	2, 840	1, 880	1, 640	1, 380	781	658	420	442	210	165	84	218
Maryland	2, 000	1, 920	1, 800	1, 240	500	691	648	446	122	120	76	200
Missouri	9, 670	12, 200	17, 500	8, 000	2, 418	3, 575	5, 688	1, 800	221	135	114	201
New Jersey	2, 400	2, 400	2, 200	1, 900	948	1, 200	462	380	216	214	210	250
Oklahoma	3, 800	4, 000	4, 000	3, 000	950	1, 260	1, 300	1, 146	165	185	186	175
Virginia	3, 040	3, 100	3, 100	2, 320	608	976	781	731	191	173	141	144
Washington	820	840	640	650	287	294	234	228	139	135	118	225
Total	184, 830	173, 710	199, 060	180, 910	57, 086	56, 498	69, 698	57, 220	160	236	146	186

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

[1] Average for season. [2] Car of 1,000 melons.

TABLE 228.—*Watermelons: Car-lot shipments by State of origin, 1920–1927*

State and year	Crop movement season [1]									
	April	May	June	July	August	September	October	November	December	Total
Missouri:	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
1920				26	2, 420	343				2, 789
1921				506	2, 406	243	2			3, 157
1922				435	2, 138	179				2, 752
1923				4	1, 415	357	7			1, 783
1924					800	619	13			1, 432
1925				186	2, 562	545				3, 293
1926				170	2, 351	322				2, 843
1927 [2]				1	236	241	2			480
North Carolina:										
1920			1	194	605	17				817
1921			11	856	781	9				1, 657
1922				568	424	1				993
1923				479	1, 057	6				1, 542
1924				94	546	24				664
1925				409	575	7				991
1926			1	103	1, 129	68				1, 301
1927 [2]				89	982					1, 071
South Carolina:										
1920				3, 877	941	5				4, 823
1921			80	4, 047	357	1	5			4, 490
1922			197	4, 389	85	5	1			4, 677
1923				3, 642	361	6				4, 009
1924			8	4, 137	820	7				4, 972
1925			52	3, 393	778	9				4, 232
1926			2	4, 248	1, 115	30				5, 395
1927 [2]			75	3, 537	415		1			4, 028

[1] Crop movement season extends from Apr. 1 through December of a given year.
[2] Preliminary.

TABLE 228.—*Watermelons: Car-lot shipments by State of origin, 1920–1927*—Con.

State and year	Crop movement season									
	April	May	June	July	August	September	October	November	December	Total
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
Georgia:										
1920			245	7,325	2,389	21				9,980
1921		5	4,535	8,123	2,351	24	3			15,041
1922		1	6,052	6,285	1,065	15				13,418
1923			1,238	4,560	1,399	24	1			7,222
1924			991	11,621	3,708	24	3			16,317
1925			3,507	7,616	3,337	203	1			14,751
1926			1,869	13,793	3,621	93	3			19,379
1927 [2]			4,375	10,567	1,830	61	1			16,834
Florida:										
1920		9	3,079	1,474	13					5,175
1921	7	1,102	4,319	522	13					5,963
1922	8	3,561	7,118	648	6					11,341
1923	3	736	2,973	604	1					4,317
1924		50	3,687	2,602	14					[3] 6,355
1925		454	5,334	1,401	1					7,190
1926		65	4,473	3,830	16					8,384
1927 [2]	4	1,423	6,190	813	32					8,462
Alabama:										
1920			8	728	520	76				1,332
1921		1	178	716	465	114	1			1,475
1922			240	1,297	297	105	2			1,941
1923			14	841	328	73				1,256
1924			66	1,633	527	45	7			2,278
1925			399	1,001	388	92				1,880
1926			50	1,347	340	143	1			1,881
1927 [2]			354	752	207	65				1,378
Texas:										
1920		2	746	3,242	1,078	123	4			5,195
1921		16	977	2,405	790	142	17			4,347
1922		4	903	1,990	1,255	49	2			4,203
1923			663	3,578	993	71	12			5,317
1924			718	3,597	2,046	133	15	4		6,513
1925		60	652	1,698	650	94	3			3,157
1926		1	1,846	3,734	655	73	5			6,314
1927 [2]		206	3,095	2,359	502	40	4			6,206
California:										
1920		6	784	1,010	1,160	312	33	22	63	3,390
1921		9	947	1,412	1,024	342	39			3,773
1922			748	1,971	1,115	431	37			4,302
1923		26	1,232	1,435	848	407	104	2		4,054
1924		15	1,079	1,975	915	291	30			4,305
1925		82	1,616	1,748	788	227	59	2		4,522
1926		359	3,068	2,282	438	125	6			6,278
1927 [2]		53	1,672	2,458	787	165	35			5,170
Other States:										
1920			12	181	2,275	1,333	12			3,813
1921			14	642	4,069	1,108	13			5,846
1922			33	420	2,676	831	38			3,998
1923			9	203	2,181	1,101	35			3,529
1924			53	365	1,094	1,315	52			2,879
1925		9	207	362	2,445	1,123	19			4,165
1926		18	115	366	1,832	1,007	13			3,351
1927 [2]		1	132	342	1,126	670	31			2,302
Total:										
1920		17	5,475	18,057	11,401	2,230	49	22	63	37,314
1921	7	1,133	11,061	19,229	12,256	1,983	80			45,749
1922	8	3,566	15,291	18,003	9,061	1,616	80			47,625
1923	3	762	6,129	15,346	8,583	2,045	159	2		33,029
1924		65	6,602	26,024	10,470	2,458	120	4		[3] 45,745
1925		605	11,767	17,814	11,524	2,300	82	2		44,184
1926		443	11,424	29,873	11,497	1,861	28			55,126
1927 [2]	4	1,683	15,893	20,918	6,117	1,242	74			45,931

Bureau of Agricultural Economics. Compiled from daily and monthly reports received by the bureau from officials and local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis.

[2] Preliminary. [3] Includes 2 cars in January.

TABLE 229.—*Watermelons, Tom Watson: Price per car to jobbers at four markets, 1924–1927* [1]

Market and season		July	August	Market and season [2]	June	July	August
	Dollars	*Dollars*	*Dollars*		*Dollars*	*Dollars*	*Dollars*
Chicago:				Philadelphia:			
1924	576. 00	249. 00	291. 00	1924		223. 00	254. 00
1925	576. 00	362. 00	[3] 211. 00	1925		315. 00	[3] 212. 00
1926	623. 00	281. 00	[3] 202. 00	1926		219. 00	204. 00
1927	471. 00	289. 00		1927	408. 00	307. 00	258. 00
New York:				St. Louis:			
1924	474. 00	[4] 270. 00	[4] 273. 00	1924	[5] 2. 76	253. 00	
1925	[4] 512. 00	[4] 311. 00	202. 00	1925	[5] 2. 88	363. 00	[3] 185. 00
1926	460. 00	248. 00	180. 00	1926	[5] 2. 71	256. 00	[3] 150. 00
1927	435. 00	289. 00	237. 00	1927	[5] 2. 36	305. 00	

Bureau of Agricultural Economics. Compiled from daily market reports from bureau representatives in the various markets. Average prices as shown are based on stock of good merchantable quality and condition; they are simple averages of daily range of selling prices.

[1] Quotations are for Southeastern, 22–26 pound average, except in St. Louis, 22–28 pound average.
[2] Quotations began June 6, 1924; May 28, 1925; May 28, 1926; May 16, 1927. Last reported quotations of season Aug. 30, 1924; Sept. 5, 1925; Sept. 1, 1926; Aug. 26, 1927.
[3] Thurmond Gray.
[4] Auction sales.
[5] Bulk per hundredweight.

TABLE 230.—*Truck crops, commercial crop: Acreage and production, United States, 1921–1927*

ACREAGE

Crop	1921	1922	1923	1924	1925	1926	1927
	Acres	*Acres*	*Acres*	*Acres*	*Acres*	*Acres*	
Asparagus	32, 140	32, 860	42, 050	50, 560	65, 530	84, 980	
Beans, snap	34, 830	49, 550	61, 280	84, 600	104, 550	98, 120	
Cabbage	104, 580	133, 830	104, 880	119, 120	119, 970	129, 330	
Cantaloupes	77, 450	103, 300	84, 160	95, 250	93, 260	101, 690	
Carrots			9, 770	11, 480	15, 760	19, 000	
Cauliflower	8, 510	9, 250	11, 580	13, 000	15, 180	22, 520	
Celery	14, 880	19, 190	20, 350	22, 710	22, 830	24, 130	
Corn, sweet	136, 280	197, 600	252, 590	302, 790	393, 910	317, 310	
Cucumbers	80, 610	82, 200	91, 960	121, 700	142, 190	111, 810	
Eggplant	2, 420	2, 210	2, 470	2, 690	3, 490	3, 260	
Lettuce	31, 460	44, 900	57, 990	68, 660	86, 020	105, 500	
Onions	57, 070	63, 290	61, 940	65, 090	65, 050	74, 200	
Peas, green	133, 850	171, 800	207, 210	254, 270	260, 310	261, 840	
Peppers	7, 530	7, 860	8, 030	11, 160	13, 700	15, 330	
Potatoes, early	265, 920	311, 930	281, 740	312, 250	298, 780	309, 450	
Spinach	22, 810	23, 760	30, 550	34, 390	44, 510	51, 580	
Strawberries	109, 500	132, 800	148, 360	176, 470	145, 060	152, 480	
Tomatoes	160, 010	345, 420	379, 280	441, 790	483, 750	372, 430	
[illegible]ons	155, 660	211, 060	167, 350	184, 830	173, 710	199, 060	
[illegible]al	1, 435, 600	1, 942, 810	2, 013, 540	2, 372, 870	2, 547, 560	2, 454, 080	[illegible], 400, 030

PRODUCTION

Asparagus ... crates	3, 287, 000	4, 041, 000	5, 854, 000	5, 500, 000	6, 301, 000	7, 813, 000	7, 874, 000
Beans, snap ... tons	66, 800	79, 600	100, 200	110, 700	149, 800	117, 300	122, 300
Cabbage ... do	687, 000	1, 089, 000	805, 700	1, 086, 300	947, 100	1, 034, 200	1, 162, 600
Cantaloupes ... crates	11, 549, 000	12, 805, 000	11, 745, 000	13, 834, 000	14, 553, 000	14, 393, 000	15, 272, 000
Carrots ... bushels			3, 184, 000	4, 084, 000	4, 800, 000	5, 523, 000	8, 002, 000
Cauliflower ... crates	2, 283, 000	2, 589, 000	3, 322, 000	2, 741, 000	3, 403, 000	5, 538, 000	4, 299, 000
Celery ... do	4, 542, 000	5, 030, 000	5, 477, 000	6, 741, 000	6, 685, 000	6, 476, 000	7, 407, 000
Corn, sweet ... tons	360, 600	474, 700	603, 300	527, 800	1, 014, 100	816, 000	395, 800
Cucumbers ... bushels	8, 267, 000	8, 867, 000	7, 671, 000	7, 549, 000	12, 699, 000	9, 224, 000	8, 703, 000
Eggplant ... do	882, 000	856, 000	850, 000	795, 000	904, 000	791, 000	746, 000
Lettuce ... crates	7, 709, 000	8, 837, 000	11, 672, 000	13, 221, 000	16, 076, 000	17, 150, 000	17, 652, 000
Onions ... bushels	14, 165, 000	18, 763, 000	17, 306, 000	19, 146, 000	19, 423, 000	20, 945, 000	22, 494, 000
Peas, green ... tons	125, 800	181, 700	180, 900	274, 400	242, 400	261, 100	236, 800
Peppers ... bushels	2, 874, 000	2, 654, 000	2, 953, 000	3, 674, 000	3, 455, 000	3, 890, 000	3, 502, 000
Potatoes, early ... do	30, 193, 000	36, 198, 000	26, 245, 000	40, 203, 000	30, 406, 000	34, 615, 000	41, 334, 000
Spinach ... tons	61, 700	67, 900	95, 800	108, 300	106, 600	124, 400	137, 100
Strawberries ... quarts	180, 670, 000	260, 403, 000	256, 409, 000	318, 121, 000	228, 577, 000	277, 940, 000	342, 284, 000
Tomatoes ... tons	724, 200	1, 658, 000	1, 609, 000	1, 687, 000	2, 321, 600	1, 375, 800	1, 621, 500
Watermelons ... number	61, 774, 000	71, 128, 000	42, 734, 000	57, 086, 000	56, 498, 000	69, 698, 000	57, 220, 000

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

TABLE 231.—*Fruits and vegetables: Unloads of 13 commodities at 11 markets in car lots, 1920–1927*

Commodity and year	New York	Chicago	Philadelphia	Pittsburgh	St. Louis	Cincinnati	Minneapolis	Kansas City	Washington	Cleveland	Detroit	Total
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
Apples:												
1920	10,528	7,081	3,198	2,792	1,975	1,617	464	1,006	561	1,698	963	31,883
1921	11,984	6,634	3,416	2,808	1,856	1,810	422	1,002	369	1,184	1,080	32,565
1922	12,764	6,575	2,539	3,020	2,111	1,257	712	775	454	1,901	1,402	33,510
1923	15,538	10,364	3,211	3,005	2,736	1,659	681	1,507	674	1,861	1,782	43,018
1924	14,280	6,605	2,996	2,799	1,960	1,531	748	701	556	1,614	1,234	35,024
1925	13,761	7,774	2,510	2,570	1,950	1,295	873	1,421	557	1,570	2,126	36,407
1926	14,606	7,834	2,622	2,628	2,097	1,179	939	924	615	6,754	2,086	37,284
1927	[1] 12,827	6,868	1,586	2,127	1,248	1,301	712	1,050	316	[1] 1,106	1,824	30,965
Cabbage:												
1920	2,225	1,355	1,906	1,297	864	596	121	399	391	617	290	10,061
1921	3,030	1,780	1,962	1,105	1,049	669	75	400	386	505	262	11,223
1922	3,333	1,697	2,166	1,219	1,121	781	104	515	468	576	392	12,372
1923	3,981	1,685	2,233	1,274	1,018	729	81	503	390	536	401	12,831
1924	4,185	1,877	2,217	1,191	1,230	762	123	471	471	732	496	13,755
1925	3,729	1,872	2,243	1,101	1,216	700	175	484	473	572	544	13,109
1926	4,329	2,058	2,049	1,303	1,253	759	208	451	512	714	757	14,393
1927	[1] 4,240	1,878	2,039	1,228	1,237	675	147	448	431	[1] 728	670	13,721
Cantaloupes:												
1920	3,788	2,061	1,065	1,275	452	554	94	396	232	657	552	11,126
1921	4,781	2,308	1,258	1,322	539	640	166	452	242	733	557	12,908
1922	5,535	2,800	1,542	1,244	618	676	214	422	306	912	584	14,853
1923	4,521	2,237	1,226	1,203	512	461	199	309	253	749	536	12,206
1924	5,742	2,508	1,416	1,203	728	813	260	408	306	906	686	14,976
1925	6,908	2,973	1,434	1,392	784	678	297	420	356	1,086	969	17,297
1926	7,390	2,960	1,712	1,230	711	652	220	390	357	1,062	877	17,570
1927	[1] 7,401	3,211	1,932	1,302	697	667	243	426	359	[1] 1,039	1,000	18,277
Celery:												
1920	1,276	979	753	529	217	207	89	220	193	144	154	4,761
1921	1,691	1,479	951	665	354	316	126	304	197	243	264	6,590
1922	1,981	1,689	814	677	350	331	152	321	214	217	321	7,067
1923	2,507	1,818	850	830	386	370	214	382	241	340	466	8,404
1924	2,998	1,631	1,186	822	441	382	244	313	257	361	574	9,209
1925	3,307	2,376	1,342	798	544	396	295	341	313	356	706	10,774
1926	3,275	2,121	1,281	758	528	335	330	331	263	337	578	10,137
1927	[1] 4,463	2,378	1,512	817	566	412	321	368	346	[1] 423	712	12,318
Grapes:												
1923 [2]	14,272	4,799	3,553	2,587	741	603	177	349	154	1,373	1,302	29,910
1924	14,496	7,200	4,074	2,569	912	552	304	471	207	1,789	1,167	33,741
1925	17,179	6,533	4,960	2,979	855	551	322	506	284	2,393	1,853	38,415
1926	18,753	5,822	4,630	3,007	772	562	442	363	237	1,204	1,679	37,501
1927	[1] 20,784	7,029	4,367	2,486	917	595	370	399	291	[1] 1,740	1,746	40,724
Lettuce:												
1924	7,133	3,331	2,319	876	775	564	357	458	356	753	757	17,679
1925	7,484	3,900	2,450	974	954	547	466	523	424	865	1,085	19,672
1926	8,341	4,293	2,708	1,008	1,109	514	513	602	539	968	1,160	21,755
1927	[1] 9,054	4,548	2,911	1,087	1,271	561	463	636	530	[1] 1,017	1,372	23,450
Onions:												
1920	3,723	1,236	1,554	1,115	687	283	107	426	223	593	654	10,601
1921	4,429	1,545	1,482	922	559	314	91	345	190	498	558	10,930
1922	4,933	1,673	1,698	951	672	400	115	453	235	548	675	12,353
1923	8,338	1,951	1,790	941	664	394	95	454	247	662	732	16,268
1924	8,118	1,955	2,067	1,023	788	480	142	537	292	745	795	16,942
1925	8,363	2,042	2,110	922	776	453	140	473	310	800	979	17,368
1926	8,009	2,349	2,018	898	877	421	207	388	307	781	1,133	17,388
1927	[1] 9,469	2,327	2,018	858	964	423	156	455	276	[1] 748	1,130	18,824
Peaches:												
1920	2,406	1,264	837	849	347	481	64	158	190	477	610	7,692
1921	4,143	1,326	1,056	759	481	600	101	268	148	532	555	9,969
1922	4,617	2,107	1,016	1,071	438	609	192	231	204	850	[illegible]	12,521
1923	3,496	1,404	778	744	542	649	158	320	220	692	774	9,777
1924	4,693	1,845	1,093	841	777	762	233	338	226	1,146	1,123	13,077
1925	4,972	1,998	991	914	631	626	217	278	273	849	1,287	13,036
1926	6,032	2,689	1,295	1,095	742	860	254	382	365	1,162	1,660	16,536
1927	[1] 4,773	2,158	959	769	608	641	266	305	293	[1] 863	1,243	12,878
Potatoes:												
1920	15,078	11,299	7,130	5,614	2,512	2,189	756	2,145	874	3,109	2,695	53,401
1921	17,986	13,077	7,460	5,396	3,592	2,857	815	2,257	1,153	3,175	2,203	60,001
1922	20,100	13,912	8,023	5,009	4,290	3,447	717	2,433	1,623	3,506	2,948	66,008
1923	21,330	14,436	8,519	4,906	3,012	2,942	735	2,417	1,646	3,105	2,818	65,866
1924	22,726	15,664	8,272	4,033	2,905	2,698	520	2,512	1,784	3,499	2,465	67,078
1925	23,002	14,768	8,698	3,897	3,696	3,188	707	3,125	1,859	2,872	3,381	69,193
1926	20,978	14,856	8,156	3,609	3,947	3,243	1,265	2,941	1,691	3,669	4,468	68,823
1927	[1] 22,308	15,685	7,818	3,775	4,410	3,001	798	2,907	1,691	[1] 3,703	5,500	71,596

[1] Subject to revision.

[2] Reports began June 1.

TABLE 231.—*Fruits and vegetables: Unloads of 13 commodities at 11 markets in car lots, 1920–1927*—Continued

Commodity and year	New York	Chicago	Philadelphia	Pittsburgh	St. Louis	Cincinnati	Minneapolis	Kansas City	Washington	Cleveland	Detroit	Total
Strawberries:	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
1920	736	767	268	185	85	80	81	68	34	138	171	2,616
1921	1,101	1,499	300	321	132	356	147	180	50	239	225	4,550
1922	2,193	1,719	568	497	265	474	351	262	48	342	552	7,271
1923	2,507	1,696	750	516	277	559	246	129	62	393	548	7,683
1924	2,537	1,809	691	458	229	355	228	146	57	349	550	7,409
1925	2,005	942	455	285	130	340	184	145	71	260	413	5,230
1926	1,625	1,526	363	360	171	282	236	124	61	279	478	5,505
1927	[1] 2,181	1,701	447	484	296	364	235	225	85	[1] 426	718	7,162
Sweet potatoes:												
1921	1,592	1,231	440	913	194	368	91	180	197	563	286	6,055
1922	1,625	1,315	378	962	127	401	141	147	183	543	293	6,175
1923	1,255	1,497	409	944	136	413	133	102	180	606	389	6,064
1924	1,286	1,096	350	757	106	359	116	53	146	456	317	5,042
1925	1,678	1,383	415	809	134	428	148	55	201	533	463	6,247
1926	2,113	1,407	414	834	183	481	158	111	288	641	583	7,273
1927	[1] 2,707	1,859	422	1,014	318	603	184	180	251	[1] 655	781	8,974
Tomatoes:												
1920	1,779	1,183	810	765	220	218	49	214	149	152	174	5,713
1921	2,872	1,588	1,105	919	327	287	58	262	193	146	203	7,960
1922	3,974	1,918	1,382	1,219	444	438	121	330	254	271	470	10,821
1923	3,981	1,652	1,436	1,321	309	339	106	302	226	231	425	10,328
1924	4,623	2,042	1,507	1,134	443	345	158	239	248	305	455	11,499
1925	4,931	2,128	1,478	1,122	442	309	174	240	261	268	663	12,016
1926	5,170	2,568	1,130	1,068	481	283	172	236	227	299	766	12,400
1927	[1] 7,168	3,314	1,726	1,488	655	505	256	314	387	[1] 377	1,098	17,288
Watermelons:												
1923	2,324	1,486	979	556	724	486	221	399	314	562	571	8,625
1924	3,413	1,021	1,473	737	950	862	411	573	459	854	898	12,551
1925	3,201	2,326	1,351	717	1,188	680	404	570	527	824	1,070	12,870
1926	3,835	2,517	1,743	808	1,343	938	363	627	693	953	1,284	15,164
1927	[1] 3,328	2,397	1,340	795	930	704	298	513	494	[1] 811	1,167	12,867
Total (13 commodities):[3]												
1920	48,295	27,225	17,521	14,421	7,359	6,225	1,828	5,032	2,847	7,585	6,272	144,610
1921	59,107	32,467	19,430	15,130	9,083	8,217	2,122	5,650	3,131	7,818	6,193	168,348
1922	67,448	35,405	20,126	15,809	10,436	8,874	2,819	5,989	4,079	9,666	8,633	189,344
1923	89,906	45,025	25,734	18,827	11,057	9,604	3,049	7,173	4,607	11,110	10,744	236,836
1924	102,035	49,484	29,661	18,443	12,244	10,465	3,844	7,220	5,365	13,509	11,517	263,787
1925	105,285	51,015	30,437	18,480	13,300	10,197	4,402	8,587	5,909	13,248	15,539	276,399
1926	107,870	53,060	30,121	18,666	14,214	10,509	5,316	7,870	6,155	13,913	17,509	285,203
1927	113,161	55,353	29,077	18,230	14,117	10,542	4,440	8,226	5,750	13,636	18,961	291,502

Bureau of Agricultural Economics. Compiled from daily reports made by common carriers to bureau representatives in the various markets. Unloads as shown in car lots include those by boat reduced to car-lot basis.

[1] Subject to revision.
[3] The totals include l. c. l. unloads for New York, converted to car-lot equivalents: 6,756 cars in 1920; 5,498 in 1921; 6,303 in 1922; 5,856 in 1923; 5,805 in 1924; 4,765 in 1925; 3,414 in 1926; 2,458 in 1927.

TABLE 232—*Beans, dry: Acreage, production, value, exports, etc., United States, 1899, 1909, 1914–1927*

Year	Acreage	Average yield per acre	Production	Price per bushel received by producers Dec. 1 [1]	Farm value	Value per acre [1]	Wholesale prices at Chicago [2]	Imports year beginning July 1 [3]	Domestic exports, year beginning July 1 [3] [4]
	1,000 acres	*Bushels*	*1,000 bushels*	*Dollars*	*1,000 dollars*	*Dollars*	*Dollars*	*1,000 bushels*	*1,000 bushels*
1899	*454*	*11.2*	*5,064*				1.23	([5])	
1909	*803*	*14.0*	*11,251*				2.27	1,015	
1914	875	13.2	11,585	2.26	26,213	29.96	1.33	908	
1915	928	11.1	10,321	2.59	26,771	28.85	1.91	663	
1916	1,107	9.7	10,715	5.10	54,686	49.40	2.54	3,748	
1917	1,821	8.8	16,045	6.50	104,350	57.30	5.45	4,146	1,517
1918	1,744	10.0	17,397	5.28	91,863	52.67	6.89	4,016	4,489
1919	*1,162*	*12.1*	*14,079*						
1919	1,065	12.6	13,399	4.26	57,046	53.56	4.75	3,806	1,903
1920	852	10.8	9,225	2.96	27,282	32.02	4.06	824	1,216
1921	782	11.7	9,185	2.67	24,515	31.35	2.77	520	1,100
1922	1,086	11.9	12,877	3.74	48,133	44.32	4.48	2,623	672
1923	1,344	12.1	16,308	3.67	59,782	44.48	4.22	886	605
1924	*1,637*								
1924	1,576	9.6	15,164	3.74	56,744	36.00	3.28	1,421	549
1925	1,606	12.4	19,928	3.28	65,376	40.71	3.70	1,271	576
1926	1,649	10.5	17,396	2.93	51,005	30.93	2.97	1,051	529
1927 [6]	1,605	10.5	16,872	2.89	48,732	30.36	[7] 3.31		

Bureau of Agricultural Economics. Italic figures are census returns; census figures include all States; other figures, estimates of crop-reporting board, principal producing States only.

[1] Farm prices and values are as of Nov. 15, 1914-1924.
[2] Prices 1899 and 1909 from Chicago Board of Trade annual reports, quotations for navy, good to choice; 1914-1927 from Daily Trade Bulletin, pea beans (quoted per 100 pounds; converted to bushels of 60 pounds).
[3] Imports and exports compiled from Foreign Commerce and Navigation of the United States, 1910-1918, and Monthly Summaries of Foreign Commerce of the United States June issues, 1919-1927.
[4] Not separately reported prior to 1918.
[5] Not separately reported.
[6] Preliminary.
[7] 11 months.

TABLE 233.—*Beans, dry: Acreage, production, and December 1 price, by States, 1924–1927*

State	Acreage				Average yield per acre				Production				Price per bushel received by producers Dec. 1—			
	1924	1925	1926	1927 [1]	1924	1925	1926	1927	1924	1925	1926	1927 [1]	1924 [2]	1925	1926	1927
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*1,000 bush.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*
Me.	4	5	5	6	17.0	14.0	17.0	16.0	68	70	85	96	4.90	5.00	5.50	4.00
Vt.	4	5	5	5	15.0	11.0	10.0	14.0	60	55	50	70	4.00	1.50	5.00	4.10
N. Y.	158	135	97	82	13.0	10.8	11.8	13.0	2,054	1,458	1,145	1,066	3.80	4.00	3.70	3.70
Mich.	625	639	552	566	10.5	13.5	12.0	9.0	6,562	8,626	6,624	5,094	3.15	2.95	2.80	3.00
Wis.	10	12	9	6	8.5	11.0	7.5	6.7	85	132	68	40	3.40	3.20	3.00	3.30
Minn.	10	8	7	5	10.0	13.0	12.0	11.0	100	104	84	55	3.70	3.40	3.10	3.30
Nebr.	2	2	4	5	10.0	9.0	8.3	12.3	20	18	33	62	4.00	3.60	3.70	3.50
Mont.	25	37	43	55	12.0	12.5	10.0	17.0	300	462	430	935	3.30	3.05	2.80	3.00
Idaho	65	72	54	72	19.5	22.0	18.5	23.7	1,268	1,584	999	1,706	4.10	2.70	2.60	2.50
Wyo.	8	12	16	17	12.0	15.0	12.5	18.0	96	180	200	306	3.55	3.00	3.00	2.90
Colo.	280	320	350	287	3.4	7.0	3.0	5.5	952	2,240	1,050	1,578	3.10	2.40	2.80	2.70
N. Mex.	174	114	195	195	5.0	3.5	4.3	5.0	870	399	838	975	3.80	3.30	2.60	2.90
Ariz.	5	5	7	8	6.0	8.0	8.0	8.0	30	40	56	64	4.50	4.20	3.50	3.60
Calif.	206	240	305	296	13.1	19.0	18.8	16.3	2,699	4,560	5,734	4,825	5.20	4.10	3.00	2.70
U. S.	1,576	1,606	1,649	1,605	9.6	12.4	10.5	10.5	15,164	19,928	17,396	16,872	3.74	3.28	2.93	2.89

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

[1] Preliminary. [2] Nov. 15 price.

TABLE 234.—*Beans, dry; Production by varieties, leading States, 1924–1927*

State and year	White pea beans	Small white	Large white	Great Northern	Yellow eye	White kidney	Red kidney	Cranberry	Red Mexican	Pinto	Pinks	Limas [1]	Black eye	Other varieties [2]	Total
	1,000 bu.	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*	*1,000 bu.*
Maine:															
1924	12		3		29	6	8							10	68
1925	11		2		30	7	9							11	70
1926	17		7		37	8	8							8	85
1927	19		8		41	10	10							8	96
Vermont:															
1924	13		5		24	3	3							12	60
1925	12		3		23	3	3							11	55
1926	9		3		22	3	3							10	50
1927	14		5		29	4	4							14	70
New York: [3]															
1924	575		288		246	123	740							82	2,054
1925	437		365		146	87	365							58	1,458
1926	355		137		149	137	344							23	1,145
1927	383		139		139	85	288							32	1,066
Michigan:															
1924	5,512		263				656							131	6,562
1925	7,073		345				1,035							173	8,626
1926	5,630		199				729							66	6,624
1927	4,330		204				458							102	5,094
Wisconsin:															
1924	76		4											5	85
1925	112		16											4	132
1926	58		5											5	68
1927	30		3											7	40
Minnesota:															
1924	100														100
1925	104														104
1926	84														84
1927	55														55
Nebraska:															
1924		6								9					15
1925		7								11					18
1926		13								20					33
1927		25								37					62
Montana:															
1924				285										15	300
1925				407										55	462
1926				422										8	430
1927				888										47	935
Idaho:															
1924		32	178	773										285	1,268
1925		50	341	990										203	1,584
1926		35	35	760					43					126	999
1927				1,416					102					188	1,706
Wyoming:															
1924				82										14	96
1925				133						13				34	180
1926				162						22				16	200
1927				214						61				31	306
Colorado:															
1924										933				19	952
1925										2,128				112	2,240
1926		11		11						996				32	1,050
1927				5						1,535		10		28	1,578
New Mexico:															
1924										818	17			35	870
1925										375	8			16	399
1926										805	8			25	838
1927										917	29			29	975
Arizona:															
1924										1	25			4	30
1925										1	34			5	40
1926										1	48			7	56
1927										1	55			8	64
California:															
1924		189	54				27	108	135		351	1,403	351	81	2,699
1925		375	50				40	85	200		960	1,870	825	65	4,560
1926		287	57				115	172	115		1,032	3,039	802	115	5,734
1927		483	24				106	188	217	34	893	2,268	516	96	4,825
Total 14 States:															
1924	6,288	227	795	1,140	299	132	1,434	108	135	1,761	393	1,403	351	693	15,159
1925	7,749	432	1,122	1,530	199	97	1,452	85	200	2,528	1,002	1,870	825	747	19,928
1926	6,153	346	443	1,355	208	148	1,199	172	158	1,844	1,088	3,039	802	441	17,396
1927	4,831	508	383	2,523	209	99	866	188	319	2,585	977	2,278	516	590	16,872

Bureau of Agricultural Economics. Based upon reports by growers on proportion of total production made up of each variety, supplemented by investigations of field statisticians.

[1] Limas include baby Limas: 1924, 470; 1925, 500; 1926, 969; 1927, 542.
[2] "Other" include Bayo: 1924, 40; 1925, 40; 1926, 50; 1927, 56.
[3] Large white in New York is the marrow.

TABLE 235.—*Beans, dried; Wholesale price per 100 pounds, 1920–1927*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
	PEA, BOSTON												
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1920	7.51	7.62	7.46	7.29	7.62	7.62	7.59	6.99	6.88	6.36	5.67	5.14	6.98
1921	4.98	4.68	4.64	4.52	4.44	4.64	4.58	4.96	5.41	5.24	5.34	5.08	4.88
1922	5.14	5.76	6.88	7.34	8.14	9.69	9.75	9.03	7.06	6.97	7.68	7.81	7.60
1923	7.62	7.71	7.66	7.60	7.27	7.35	7.18	6.89	7.40	7.75	7.79	7.12	7.44
1924	7.06	7.40	7.30	7.28	7.12	7.12	7.16	7.68	8.04	8.18	8.10	8.00	7.54
1925	6.94	7.20	6.91	6.60	6.31	6.34	6.17	5.89	5.50	5.49	5.86	5.90	6.26
1926	5.67	5.49	5.32	5.06	5.01	5.48	5.65	5.48	5.28	5.93	6.32	6.11	5.57
1927	5.86	5.66	5.38	5.28	5.46	6.29	6.48	6.62	6.34	6.18	6.12	6.16	5.99
	PEA, CHICAGO												
1920	7.76	7.40	7.04	7.16	7.58	8.07	7.18	6.75	6.75	6.13	4.82	4.52	6.76
1921	4.38	4.55	4.56	4.06	4.01	4.26	4.02	4.84	5.34	5.22	5.17	4.94	4.61
1922	4.93	5.76	7.01	7.69	7.82	9.95	9.78	9.15	6.14	5.75	7.04	8.53	7.46
1923	8.25	8.43	8.18	7.83	7.79	7.76	6.60	5.68	5.99	6.35	6.10	5.54	7.04
1924	5.30	5.36	5.23	5.17	4.93	4.96	5.00	5.48	6.31	6.07	5.88	5.84	5.46
1925	6.64	6.37	6.39	6.25	6.14	6.02	6.10	6.08	6.69	6.11	5.70	5.45	6.16
1926	5.42	5.05	4.56	4.47	4.40	4.69	4.67	4.65	4.68	5.56	5.79	5.44	4.95
1927	5.18	5.08	4.54	4.50	5.10	-------	6.19	6.38	6.32	-------	5.93	5.98	-------
	SMALL WHITE, SAN FRANCISCO												
1920	6.04	6.53	6.40	5.94	6.20	6.40	6.29	5.72	5.58	4.56	4.38	4.19	5.72
1921	3.82	3.86	3.63	3.49	3.39	3.42	3.68	4.22	4.55	4.68	4.79	4.79	4.03
1922	4.89	5.25	6.08	6.50	6.58	7.59	7.39	6.33	5.40	5.59	6.11	6.48	6.18
1923	7.48	7.23	7.27	7.22	6.76	6.81	6.42	6.05	6.75	6.05	6.09	5.92	6.67
1924	5.92	6.18	6.03	6.02	6.04	6.29	7.04	7.29	7.86	8.00	7.89	7.18	6.81
1925	7.22	7.71	7.54	7.49	7.38	7.31	7.42	7.42	7.32	6.20	5.71	5.98	7.06
1926	6.26	6.25	5.97	5.87	5.62	5.57	5.83	5.95	5.66	5.89	5.94	5.81	5.88
1927	5.83	5.85	5.86	6.34	7.17	8.26	8.57	8.58	7.75	5.60	5.88	5.80	6.79
	LIMA, CALIFORNIA, NEW YORK												
1920	14.45	14.31	12.13	11.84	11.95	12.57	12.84	12.46	11.62	8.47	8.18	7.97	11.57
1921	7.62	7.67	7.10	6.56	6.77	6.90	6.55	6.69	6.79	6.65	7.05	7.32	6.97
1922	7.40	8.88	9.66	9.68	10.00	10.18	10.22	9.84	8.91	8.49	8.65	8.91	9.24
1923	9.39	9.79	9.59	9.41	8.59	8.80	8.25	8.55	9.40	9.84	10.41	10.09	9.34
1924	10.81	11.30	12.40	12.68	12.48	12.59	12.62	13.04	13.62	14.42	14.12	13.89	12.83
1925	14.41	15.00	14.79	14.85	14.94	15.27	15.79	16.27	15.92	14.11	13.24	11.88	14.71
1926	11.83	12.06	11.20	10.13	9.15	8.88	8.76	8.55	8.94	8.44	7.68	7.01	9.39
1927	7.14	6.94	6.97	6.97	6.86	6.74	6.68	6.67	6.96	6.97	6.85	6.83	6.88
	LIMA, MADAGASCAR, NEW YORK												
1920	10.25	10.16	9.32	8.44	7.83	7.58	7.46	6.77	6.08	4.97	4.50	4.38	7.31
1921	3.92	3.88	3.83	3.63	3.03	3.00	3.00	3.00	3.00	3.00	(1)	(1)	-------
1922	(1)	(1)	(1)	6.88	6.88	6.88	7.10	7.25	7.20	7.12	7.12	(1)	-------
1923	(1)	6.25	6.51	6.69	6.24	6.47	6.27	6.16	6.95	7.44	7.92	7.72	-------
1924	7.84	9.02	9.55	10.32	10.33	10.02	9.84	10.50	11.24	12.03	12.36	12.38	10.45
1925	12.35	12.60	12.75	12.51	12.38	12.38	12.45	12.59	12.39	11.93	11.14	10.03	12.12
1926	9.64	9.62	9.34	8.71	7.98	7.88	7.73	7.58	7.38	7.12	7.12	(1)	-------

Bureau of Agricultural Economics. Compiled from the Boston Chamber of Commerce, weekly, 1920–1925; from the Boston Produce Market Report, weekly, 1926 and 1927; Chicago Daily Trade Bulletin; San Francisco Commercial News, daily; and New York Producers Price Current, daily. (Quotations for Madagascar discontinued November, 1926.)

[1] No quotations.

TABLE 236.—*Beans, dry: Car-lot shipments by State of origin, 1920–1927*

State	1920	1921	1922	1923	1924	1925	1926	1927, preliminary
	Cars	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*	*Cars*
New York	656	1, 327	1, 599	1, 775	1, 917	1, 527	987	892
Michigan	3, 187	5, 090	5, 087	5, 098	8, 701	8, 748	9, 239	7, 717
Idaho	185	146	395	604	1, 095	1, 788	1, 542	1, 856
Colorado	231	542	483	1, 091	1, 454	2, 426	2, 186	1, 762
New Mexico	608	974	289	85	275	307	358	500
California	3, 956	3, 854	3, 822	3, 284	2, 230	2, 278	2, 806	3, 246
Other States	158	122	86	153	231	466	565	706
Total	8, 981	12, 955	11, 761	12, 990	15, 903	17, 540	17, 683	16, 679

Bureau of Agricultural Economics. Compiled from monthly reports received by the bureau from local agents of common carriers throughout the country. Shipments as shown in car lots include those by boat reduced to car-lot basis.

TABLE 237.—*Soy beans: Estimated price per bushel, received by producers, United States, 1913–1927*

Year beginning October	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Weighted average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1913	196	157	172	196	180	176
1914	208	215	224	235	226	218
1915	188	208	223	231	230	211
1916	213	213	218	220	245	216
1917	273	286	333	347	382	305
1918	336	320	329	300	300	323
1919	334	335	344	376	405	345
1920	341	300	228	218	217	280
1921	220	222	208	211	216	217
1922	189	206	197	207	213	200
1923	209	211	211	223	226	212
1924	223	216	236	259	264	229
1925	227	218	217	238	233	223
1926	197	185	183	190	203	189
1927	186	170	161			

Bureau of Agricultural Economics. Based upon returns from special price reporters.

TABLE 238.—*Soy beans for seed: Average wholesale selling price per 100 pounds at Baltimore and St. Louis, 1920–1927*

Year	Baltimore						St. Louis					
	Jan.	Feb.	Mar.	Apr.	May	Av.	Jan.	Feb.	Mar.	Apr.	May	Av.
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Average 1921–1925		3. 98	4. 06	4. 10	4. 14		4. 40	4. 57	4. 63	4. 36	4. 62	4. 52
1920	6. 80	8. 00	8. 00	8. 00	8. 60	7. 88	8. 10	10. 00	9. 90	9. 65	10. 00	9. 53
1921	3. 15	3. 50	3. 50	3. 75	4. 70	3. 72	4. 30	5. 40	5. 75	5. 00	5. 40	5. 17
1922	3. 20	3. 50	3. 50	3. 50	3. 30	3. 40	4. 00	4. 00	4. 20	3. 85	4. 55	4. 12
1923		4. 00	4. 00	3. 80	3. 75		5. 00	4. 75	4. 50	4. 50	4. 95	4. 74
1924	3. 50	4. 00	4. 00	4. 50	5. 00	4. 20	4. 70	4. 70	4. 70	4. 70	4. 60	4. 68
1925	5. 10	4. 90	5. 25	4. 95	3. 95	4. 83	4. 00	4. 00	4. 00	3. 75	3. 60	3. 87
1926	3. 35	3. 42	3. 50	3. 56	4. 62	3. 69	3. 55	3. 61	3. 88	4. 25	4. 85	4. 03
1927	3. 00	3. 00	3. 00	3. 00	3. 12	3. 02		4. 50	4. 00	4. 19	4. 50	

Bureau of Agricultural Economics. Compiled from weekly reports to the bureau from seedsmen in the various markets. These prices are the average wholesale selling prices for high quality seed.

Table 239.—*Cowpeas: Estimated price per bushel, received by producers, United States, 1915–1927*

Year beginning August—	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	July 15	Weighted average
	Cts.	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
1915	174	155	156	151	152	156	157	154	150	149	140	135	152
1916	141	142	148	162	177	192	210	232	253	293	309	303	190
1917	265	217	220	227	238	262	292	302	293	283	257	248	236
1918	241	226	234	231	238	239	252	249	268	292	344	343	254
1919	310	269	261	271	281	313	372	394	421	484	484	471	319
1920	423	369	274	243	229	197	204	205	216	243	265	287	274
1921	241	200	201	185	176	172	180	186	185	190	184	170	191
1922	166	157	154	164	167	187	198	198	208	208	217	221	173
1923	208	187	194	195	201	212	221	232	246	253	282	286	214
1924	256	241	232	234	256	282	316	343	367	370	384	367	273
1925	324	312	293	298	287	303	321	337	350	343	347	347	309
1926	322	279	234	205	195	194	194	189	193	190	190	193	221
1927	184	180	170	172	165	------	------	------	------	------	------	------	--------

Bureau of Agricultural Economics. Based upon returns from special price reporters.

Table 240.—*Cowpeas for seed: Average wholesale selling price per 100 pounds at Baltimore and St. Louis, 1920–1927*

Year	Baltimore						St. Louis					
	Jan.	Feb.	Mar.	Apr.	May	Av.	Jan.	Feb.	Mar.	Apr.	May	Av.
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Average, 1921–1925	4.79	4.95	4.90	5.13	5.35	5.02	4.66	4.79	4.93	5.08	5.58	5.01
1920	7.20	9.00	9.00	9.00	9.60	8.76	10.50	12.75	11.25	10.65	11.00	11.23
1921	4.50	4.50	4.50	5.30	6.20	5.00	4.00	4.20	4.45	5.05	6.50	4.84
1922	3.70	4.00	4.00	4.00	4.00	3.94	3.20	3.15	3.65	3.75	3.75	3.50
1923	4.25	4.25	4.25	4.25	4.25	4.25	5.00	4.95	4.75	4.75	4.95	4.88
1924	5.00	5.50	5.25	5.60	5.75	5.42	4.60	4.95	5.00	5.05	5.90	5.10
1925	6.50	6.50	6.50	6.50	6.55	6.51	6.50	6.70	6.80	6.80	6.80	6.72
1926	------	7.08	7.10	7.05	7.02	------	7.50	7.38	7.00	6.81	6.75	7.09
1927	3.75	3.75	3.56	3.50	3.50	3.61	------	4.00	4.00	4.00	4.00	------

Bureau of Agricultural Economics. Compiled from weekly reports to the bureau from seedsmen in the various markets. These prices are the average wholesale selling prices for high quality seed.

Table 241.—*Broomcorn: Acreage, production, and November 15 price, United States, 1915–1927*

Year	Acreage	Average yield per acre	Production	Price per ton received by producers Nov. 15	Year	Acreage	Average yield per acre	Production	Price per ton received by producers Nov. 15
	Acres	*Pounds*	*Short tons*	*Dollars*		*Acres*	*Pounds*	*Short tons*	*Dollars*
1915	230,100	454.1	52,242	91.67	1922	275,000	271.3	37,300	219.46
1916	235,200	329.3	38,726	172.75	1923	536,000	302.8	81,153	160.06
1917	345,000	332.8	57,400	292.75	1924	451,000	346.8	78,200	95.63
1918	366,000	340.4	62,300	233.87	1925	223,000	264.6	29,500	[1] 143.02
1919	352,000	303.4	53,400	154.57	1926	308,000	346.8	53,400	[2] 78.69
1920	275,500	265.0	36,500	126.16	1927 [3]	218,000	327.4	35,679	[2] 109.28
1921	222,000	344.2	38,200	72.20					

Bureau of Agricultural Economics. Estimates by crop-reporting board.

[1] Weighted average of the season to Dec. 1. [2] Dec. 1 price. [3] Preliminary.

TABLE 242.—*Broomcorn: Acreage, production, and December 1 price, by States, 1924–1927*

State	Acreage				Average yield per acre				Production				Price per ton received by producers Dec. 1			
	1924	1925	1926	1927[1]	1924	1925	1926	1927	1924	1925	1926	1927[1]	1924[2]	1925[3]	1926	1927
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Tons*	*Tons*	*Tons*	*Tons*	*Dols.*	*Dols.*	*Dols.*	*Dols.*
Ill	49	30	40	25	450	560	420	350	11,000	8,400	8,400	4,375	150	175	115	155
Mo	4	4	3	3	300	322	250	400	600	600	400	600	160	200	87	90
Kans	45	22	31	27	295	286	327	375	6,600	3,100	5,100	5,062	95	120	85	90
Tenn	2				350				400				100			
Okla	246	108	158	92	369	205	375	350	45,400	11,100	29,600	16,100	85	136	70	98
Tex	23	11	15	12	418	318	410	220	4,800	1,700	3,100	1,320	100	140	75	110
Colo	34	24	32	33	170	160	150	325	2,900	1,900	2,400	5,362	60	140	83	120
N. Mex	48	24	29	26	270	225	300	220	6,500	2,700	4,400	2,860	85	90	60	110
U. S	451	223	308	218	346.8	264.6	346.8	327.4	78,200	29,500	53,400	35,679	95.63	143.02	78.69	109.28

Bureau of Agricultural Economics. Estimates by crop-reporting board.

[1] Preliminary. [2] Nov. 15 price. [3] Weighted average of the season to Dec. 1.

TABLE 243.—*Cotton: Acreage, production, value, exports, etc., United States, 1849, 1859, 1866–1927*

Year	Acreage harvested	Average yield per acre	Production[1]	Price per pound received by producers, Dec. 1	Farm value, Dec. 1	Value per acre[2]	Average price per pound, New York[3]	Domestic exports, year beginning Aug. 1[4 5 7]	Imports, year beginning Aug. 1[5 8]	Net exports, year beginning Aug. 1[4 5 6 7]
	1,000 acres	*Lbs.*	*1,000 bales*	*Cents*	*1,000 dollars*	*Dollars*	*Cents*	*1,000 bales*	*1,000 bales*	*1,000 bales*
1849			*2,469*				12.34	[9] 1,271	[9] 1	[9] 1,270
1859			*5,387*				11.00	[9] 3,535	[9 10] 4	[9] 3,531
1866	7,599	129.0	1,750				31.59	[9] 1,323	[9] 2	[9] 1,324
1867	7,828	189.8	2,340				24.85	1,511	2	1,510
1868	6,799	192.2	2,380				29.01	1,288	[10] 6	1,284
1869			*3,012*				23.98			
1869	7,743	196.9	*3,012*				23.98	1,980	4	1,977
1870	8,885	198.9	3,800				16.95	2,894	3	2,893
1871	7,558	148.2	2,553				20.48	1,851	7	1,844
1872	8,483	188.7	3,920				18.15	2,437	11	2,423
1873	9,510	179.7	3,683				17.00	2,706	5	2,702
1874	11,704	147.5	3,941				15.00	2,523	5	2,520
1875	11,934	190.6	5,123				13.00	3,003	5	2,999
1876	11,677	167.8	4,438	9.0	174,724	14.96	11.73	2,869	6	2,864
1877	12,133	163.8	4,370				11.28	3,198	7	3,194
1878	12,344	191.2	5,244	8.2	192,515	15.60	10.83	3,265	6	3,259
1879	*14,480*	181.0	*5,755*	10.3	269,305	18.60	12.02	3,711	7	3,705
1880	15,951	184.5	6,343	9.8	289,083	18.12	11.34	4,409	9	4,403
1881	16,711	149.8	5,456				12.16	3,430	9	3,426
1882	16,277	185.7	6,957	9.1	275,518	16.93	10.63	4,582	9	4,577
1883	16,778	164.8	5,701	9.1	250,977	14.90	10.64	3,745	15	3,734
1884	17,440	153.8	5,682	9.2	246,575	14.14	10.54	3,740	10	3,733

[1] 500-pound gross weight bales, from 1899–1927.
[2] Based on farm price Dec. 1.
[3] Compiled from Cotton Fluctuation, 1849–1888, and are averages for crop year beginning September. From New York Commercial and Financial Chronicle, 1889–1899, and from reports of New York Cotton Exchange since 1900. Since 1889 the averages are for crop year beginning August.
[4] Excluding linters from 1914 to 1926.
[5] Compiled from Commerce and Navigation of the United States, 1849–1917, from Foreign Commerce and Navigation of the United States, 1918, and from Monthly Summaries of Foreign Commerce of the United States, June and July, 1919–1927, and January, 1927.
[6] Net exports obtained by subtracting imports from domestic exports and adding reexports which are not shown in this table.
[7] Bales of 500 pounds gross weight.
[8] Bales of 500 pounds gross weight. Imports reported in pounds net converted into bales of 478 pounds net equivalent to bales of 500 pounds gross weight.
[9] Year beginning July 1.
[10] Estimated from value of imports. Average import price per pound calculated by assuming that the percentage change in import price from the previous year is equal to the percentage change in the export prices.

TABLE 243.—*Cotton: Acreage, production, value, exports, etc., United States, 1849, 1859, 1866–1927*—Continued

Year	Acreage harvested	Average yield per acre	Production	Price per pound received by producers, Dec. 1	Farm value, Dec. 1	Value per acre	Average price per pound, New York	Domestic exports, year beginning Aug. 1	Imports, year beginning Aug. 1	Net exports, year beginning Aug. 1
	1,000 acres	*Lbs.*	*1,000 bales*	*Cents*	*1,000 dollars*	*Dollars*	*Cents*	*1,000 bales*	*1,000 bales*	*1,000 bales*
1885	18,301	164.4	6,575	8.4	251,775	13.76	9.44	4,193	11	4,185
1886	18,455	169.5	6,446	8.1	251,856	13.65	10.25	4,274	9	4,266
1887	18,641	182.7	7,020	8.5	290,901	15.61	10.27	4,557	11	4,547
1888	19,059	180.4	6,941	8.5	292,139	15.33	10.71	4,720	17	4,704
1889	*20,175*	159.7	*7,473*	8.5	275,249	13.64	11.27	4,934	19	4,915
1890	19,512	187.0	8,674	8.6	313,360	16.06	9.48	5,859	45	5,815
1891	19,059	179.4	9,018	7.2	247,633	12.99	7.68	5,888	61	5,827
1892	15,911	209.2	6,664	8.3	277,194	17.42	8.45	4,456	90	4,367
1893	19,525	149.9	7,493	7.0	204,983	10.50	7.75	5,309	58	5,253
1894	23,688	195.3	9,476	4.6	212,335	8.96	6.38	7,010	104	6,908
1895	20,185	155.6	7,161	7.6	238,503	11.82	8.10	4,710	115	4,593
1896	23,273	184.9	8,533	6.7	286,169	12.30	7.71	6,172	119	6,055
1897	24,320	182.7	10,898	6.7	296,816	12.20	6.40	7,757	102	7,653
1898	24,967	220.6	11,189	5.7	315,449	12.63	6.00	7,662	105	7,557
1899	*24,275*		*9,345*							
1899	24,327	183.8	*9,345*	7.0	326,215	13.41	8.36	6,228	140	6,091
1900	24,933	194.4	*10,123*	9.2	463,310	18.58	9.38	6,800	109	6,602
1901	26,774	170.0	*9,510*	7.0	334,088	12.48	8.73	6,949	202	6,750
1902	27,175	187.3	*10,631*	7.6	403,718	14.86	9.96	7,084	151	6,936
1903	27,052	171.3	*9,851*	10.5	516,763	19.10	12.84	6,207	103	6,107
1904	31,215	205.9	*13,438*	9.0	603,438	19.33	9.09	8,908	129	8,781
1905	27,110	186.6	*10,575*	10.8	569,791	21.02	11.30	7,118	144	6,980
1906	31,374	202.5	*13,274*	9.6	635,534	20.26	11.24	8,943	227	8,741
1907	29,660	179.1	*11,107*	10.4	575,226	19.39	11.53	7,666	153	7,518
1908	32,444	194.9	*13,242*	8.7	575,092	17.73	10.23	8,955	181	8,778
1909	*32,044*		*10,005*							
1909	30,938	154.3	*10,005*	13.9	697,681	22.55	14.66	6,353	170	6,194
1910	32,403	170.7	*11,609*	14.1	820,407	25.32	14.87	8,027	245	7,787
1911	36,045	207.7	*15,693*	8.8	687,888	19.08	10.85	11,116	233	10,885
1912	34,283	190.9	*13,703*	11.9	817,055	23.83	12.20	9,146	249	8,899
1913	37,089	182.0	*14,156*	12.2	862,708	23.26	13.21	9,508	273	9,251
1914	36,832	209.2	*16,135*	6.8	549,036	14.91	[11] 8.89	8,702	400	8,322
1915	31,412	170.3	*11,192*	11.3	631,460	20.10	11.98	6,113	458	5,673
1916	34,985	156.6	*11,450*	19.6	1,122,295	32.08	19.28	5,525	311	5,219
1917	33,841	159.7	*11,302*	27.7	1,566,198	46.28	29.68	4,402	231	4,175
1918	36,008	159.6	*12,041*	27.6	1,663,633	46.20	31.01	5,774	211	5,568
1919	*33,740*		*11,421*							
1919	33,566	161.5	*11,421*	35.6	2,034,658	60.62	38.29	6,707	732	5,993
1920	35,878	178.4	*13,440*	13.9	933,658	26.02	17.89	5,973	237	5,753
1921	30,509	124.5	*7,954*	16.2	643,933	21.11	18.92	6,348	380	5,980
1922	33,036	141.2	[12] *9,755*	23.8	1,160,968	35.14	26.24	5,007	492	4,536
1923	37,123	130.6	*10,140*	31.0	1,571,829	42.34	31.11	5,815	306	5,530
1924	*39,204*		*13,628*							
1924	41,360	157.4	*13,628*	22.6	1,540,884	37.26	24.74	8,240	328	7,923
1925	46,053	167.2	*16,104*	18.2	1,464,032	31.79	20.53	8,267	340	7,939
1926	47,087	182.6	*17,977*	10.9	982,736	20.87	15.15	11,299	419	10,900
1927 [13]	40,168	152.3	12,789	19.6	1,253,599	31.21				

Bureau of Agricultural Economics; italic figures are census returns; other acreage, yield, and productio figures are estimates by the crop-reporting board; acreage revised on census basis.

[11] Average for nine months only. Exchange closed August–Nov. 17, on account of war.
[12] Excludes Lower California.
[13] Preliminary.

TABLE 244.—*Cotton: Acreage harvested, by States, 1916–1927*

State	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927[1]
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*
Missouri	133	153	148	125	136	103	198	355	493	520	434	281
Virginia	42	50	44	42	42	31	55	71	102	100	93	67
North Carolina	1,451	1,515	1,600	1,490	1,587	1,403	1,625	1,679	2,005	2,017	1,985	1,727
South Carolina	2,780	2,837	3,001	2,835	2,964	2,571	1,912	1,965	2,404	2,654	2,648	2,421
Georgia	5,277	5,195	5,341	5,220	4,900	4,172	3,418	3,421	3,046	3,589	3,965	3,412
Florida	191	183	167	103	100	65	118	147	80	101	105	66
Tennessee	887	882	902	758	840	634	985	1,172	996	1,173	1,143	943
Alabama	3,225	1,977	2,570	2,791	2,858	2,235	2,771	3,079	3,055	3,504	3,651	3,225
Mississippi	3,110	2,788	3,138	2,848	2,950	2,628	3,014	3,170	2,981	3,466	3,752	3,338
Arkansas	2,600	2,740	2,991	2,725	2,980	2,382	2,799	3,026	3,094	3,738	3,790	3,045
Louisiana	1,250	1,454	1,683	1,527	1,470	1,168	1,140	1,405	1,616	1,874	1,979	1,560
Oklahoma	2,562	2,783	2,998	2,424	2,749	2,206	2,915	3,197	3,861	5,214	4,676	3,433
Texas	11,400	11,092	11,233	10,476	11,898	10,745	11,874	14,150	17,175	17,608	18,374	16,270
New Mexico	------	------	------	------	------	------	------	60	101	107	120	95
Arizona	------	41	95	107	230	90	101	127	180	162	167	137
California	52	136	85	85	150	55	67	83	130	169	162	128
All other	25	15	12	10	24	18	44	13	41	57	43	20
United States	34,985	33,841	36,008	33,566	35,878	30,509	33,036	37,123	41,360	46,053	47,087	40,168
Lower California (old Mexico)	------	------	88	100	125	85	135	150	137	150	130	110

Bureau of Agricultural Economics. Estimates by the crop-reporting board.

[1] Preliminary.

TABLE 245.—*Cotton: Yield per acre and estimated price per pound, December 1, by States, average 1914–1920, 1921–1925, and annual 1923–1927*

State	Yield per acre							Estimated price per pound						
	Av., 1914–1920	Av., 1921–1925	1923	1924	1925	1926	1927	Av., 1914–1920	Av., 1921–1925	1923	1924	1925	1926	1927
	Lbs.	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
Missouri	237	263	171	185	275	240	177	19.8	20.8	32.5	23.0	12.0	10.0	20.5
Virginia	248	243	325	180	250	264	230	20.3	22.7	32.0	23.0	19.0	11.4	20.0
North Carolina	253	252	200	196	201	292	237	20.2	22.7	30.8	22.6	19.0	11.5	19.5
South Carolina	327	154	187	160	160	182	145	20.6	22.6	32.0	22.1	18.8	11.7	19.6
Georgia	178	117	82	157	155	180	154	20.8	22.8	32.0	22.4	19.0	11.1	19.4
Florida	106	106	40	130	180	145	122	30.1	22.2	28.8	22.5	18.8	10.2	19.1
Tennessee	183	178	92	170	210	188	175	19.7	22.4	32.0	23.2	16.2	10.0	19.0
Alabama	134	139	91	154	185	196	178	20.3	22.7	31.8	22.7	18.9	10.7	19.0
Mississippi	162	169	91	176	275	241	192	21.1	23.3	32.5	23.7	19.5	11.6	20.5
Arkansas	180	161	98	169	205	195	151	20.5	22.1	31.0	22.8	16.1	11.0	20.2
Louisiana	157	152	125	145	232	200	167	20.1	22.0	30.3	22.4	18.1	11.0	19.2
Oklahoma	173	129	93	187	155	181	138	19.2	21.4	29.6	22.2	17.0	9.7	19.8
Texas	150	125	147	138	113	147	126	20.1	22.2	30.4	22.4	18.5	10.8	19.3
New Mexico	------	------	230	266	298	299	352	------	------	31.0	25.0	20.0	12.3	19.8
Arizona	------	278	292	285	350	349	325	------	27.8	34.0	26.4	21.5	13.3	25.6
California	332	271	285	284	340	387	352	24.2	24.2	32.0	24.0	22.0	14.0	21.0
United States	170.8	145.5	130.6	157.4	167.2	182.6	152.3	20.4	22.4	31.0	22.6	18.2	10.9	19.6

Bureau of Agricultural Economics.

TABLE 246.—*Cotton: Production of lint in 500-pound gross-weight bales, by States, and linters, United States, 1916–1927*

State	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927[1]
	1,000 bales	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*
Missouri	63	61	62	64	79	70	[2] 149	[2] 127	[2] 193	[2] 209	218	104
Virginia	27	19	25	23	21	16	27	51	39	53	51	32
North Carolina	655	618	898	830	925	776	852	1,020	825	1,102	1,213	857
South Carolina	932	1,237	1,570	1,426	1,623	755	492	770	807	889	1,008	735
Georgia	1,821	1,884	2,122	1,660	1,415	787	715	588	[2] 1,002	1,164	1,496	1,100
Florida	41	38	29	16	18	11	25	12	[2] 22	38	32	17
Tennessee	382	241	330	310	325	302	391	[2] 226	[2] 354	[2] 515	[2] 451	345
Alabama	533	518	801	713	663	580	823	587	[2] 985	1,357	1,498	1,200
Mississippi	812	906	1,226	961	895	813	989	604	1,099	1,991	1,888	1,340
Arkansas	1,134	974	987	884	1,214	797	[2] 1,012	[2] 622	[2] 1,094	[2] 1,600	1,548	980
Louisiana	443	639	588	298	388	279	343	368	493	910	829	545
Oklahoma	824	959	577	1,016	1,336	481	627	656	1,511	1,691	1,773	990
Texas	3,726	3,125	2,697	3,099	4,345	2,198	3,222	[2] 4,340	[2] 4,949	[2] 4,163	[2] 5,628	4,280
New Mexico	-----	-----	-----	-----	10	6	12	[2] 30	[2] 57	[2] 66	[2] 75	70
Arizona	-----	22	56	60	103	45	47	78	108	119	[2] 122	93
California	44	58	67	56	75	34	21	54	77	122	131	94
All other	14	6	6	5	3	3	7	[2] 8	[2] 14	[2] 26	[2] 17	7
United States	11,450	11,302	12,041	11,421	13,440	7,954	9,755	10,140	13,628	16,104	17,977	12,789
United States (linters)[3]	1,331	1,126	930	608	440	398	608	669	897	1,115	1,158	-----

Bureau of Agricultural Economics. Compiled from reports of the Bureau of the Census.

[1] Preliminary estimate of the Department of Agriculture.
[2] Slight differences from census figures on ginnings are due to ginnings in one State of cotton grown in another.
[3] Year beginning Aug. 1.

TABLE 247.—*Cotton ginned to specified dates and total, by seasons, and percentage of total ginned to each date, United States, 1909–1927*

Season beginning August—	Cotton ginned to—										
	Sept. 1	Sept. 25	Oct. 1	Oct. 18	Nov. 1	Nov. 14	Dec. 1	Dec. 13	Jan. 1	Jan. 16	Total ginned[1]
	1,000 bales	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*
1909	388	2,568	--------	5,531	7,018	8,112	8,877	9,358	9,647	9,788	10,073
1910	353	2,312	--------	5,424	7,346	8,780	10,140	10,695	11,085	11,253	11,568
1911	771	3,677	--------	7,759	9,971	11,313	12,817	13,771	14,317	14,516	15,553
1912	731	3,007	--------	6,874	8,869	10,300	11,855	12,430	12,907	13,089	13,489
1913	799	3,247	--------	6,974	8,830	10,445	12,088	12,927	13,348	13,582	13,983
1914	480	3,394	--------	7,620	9,827	11,668	13,073	13,972	14,443	14,916	15,906
1915	404	2,904	--------	5,709	7,379	8,771	9,704	10,306	10,637	10,752	11,068
1916	851	4,082	--------	7,303	8,624	9,615	10,352	10,839	11,039	11,138	11,364
1917	615	2,512	--------	5,574	7,185	8,571	9,714	10,132	10,435	10,571	11,248
1918	1,038	3,771	--------	6,811	7,777	8,706	9,571	10,281	10,774	11,049	11,906
1919	143	1,835	--------	4,929	6,305	7,604	8,844	9,397	10,009	10,307	11,326
1920	352	2,250	--------	5,755	7,509	8,915	10,141	10,876	11,555	12,015	13,271
1921	486	2,920	--------	5,497	6,646	7,274	7,640	7,791	7,882	7,912	7,978
1922	806	3,866	--------	6,978	8,130	8,870	9,320	9,489	9,507	9,648	9,729
1923	1,143	3,232	--------	6,409	7,556	8,369	9,243	9,549	9,805	9,914	10,171
1924	947	[2] 2,666	4,528	7,616	9,716	11,162	12,238	12,792	--------	13,307	13,639
1925	1,836	[2] 4,282	7,126	9,519	11,207	12,260	13,871	14,832	--------	15,500	16,123
1926	697	[2] 2,509	5,643	8,728	11,254	12,956	14,644	15,541	--------	16,616	17,755
1927 [3]	1,540	[2] 3,506	5,945	8,119	9,926	10,899	11,743	12,072	--------	12,502	--------

[1] Includes cotton ginned after January 16 and estimated quantities not ginned on March 1. Quantities in Table 243 converted from running bales, average weight, by deducting average weight of bagging and ties, by States.
[2] September 16.
[3] Preliminary.

TABLE 247.—*Cotton ginned to specified dates and total, by seasons, and percentage of total ginned to each date, United States, 1909–1927*—Continued.

Season beginning August—	Per cent of total ginned to—										
	Sept. 1	Sept. 25	Oct. 1	Oct. 18	Nov. 1	Nov. 14	Dec. 1	Dec. 13	Jan. 1	Jan. 16	Total ginned
1909	3.9	25.5		54.9	69.7	80.5	88.1	92.9	95.8	97.2	100.0
1910	3.1	20.0		46.9	63.5	75.9	87.7	92.5	95.8	97.3	100.0
1911	5.0	23.6		49.9	64.1	72.7	82.4	88.5	92.1	93.3	100.0
1912	5.4	22.3		51.0	65.8	76.4	87.9	92.2	95.7	97.0	100.0
1913	5.7	23.2		49.9	63.2	74.7	86.5	92.5	95.5	97.1	100.0
1914	3.0	21.3		47.9	61.8	73.4	82.2	87.8	90.8	93.8	100.0
1915	4.2	26.2		51.6	66.7	79.2	87.7	93.1	96.1	97.1	100.0
1916	7.5	35.9		64.3	75.9	84.6	91.1	95.4	97.1	98.0	100.0
1917	5.5	22.3		49.6	63.9	76.2	86.4	90.1	92.8	94.0	100.0
1918	8.7	31.7		57.2	65.3	73.1	80.4	86.3	90.5	92.8	100.0
1919	1.3	16.2		43.5	55.7	67.1	78.1	83.0	88.4	91.0	100.0
1920	2.6	17.0		43.4	56.6	67.2	76.4	82.0	87.1	90.5	100.0
1921	6.1	36.6		68.9	83.3	91.2	95.8	97.7	98.8	99.2	100.0
1922	8.3	39.7		71.7	83.7	91.2	95.8	97.5	98.6	99.2	100.0
1923	11.2	31.8		63.0	74.3	82.3	90.9	93.9	96.4	97.8	100.0
1924	6.9	[2] 19.5	33.2	55.8	71.2	81.8	89.7	93.8		97.6	100.0
1925	11.7	[2] 26.6	44.2	59.0	69.5	76.0	86.0	92.0		96.1	100.0
1926	3.9	[2] 14.1	31.8	49.2	63.4	73.0	82.5	87.5		93.6	100.0
1927 [3]											

Bureau of Agricultural Economics. Compiled from reports of Bureau of the Census; quantities are given in running bales, except that round bales are counted as half bales. Linters not included.

[2] September 16. [3] Preliminary.

TABLE 248.—*Cotton: Acreage and yield of lint per acre in specified countries, average 1909–10 to 1913–14, annual 1924–25 to 1927–28*

Country	Acreage					Yield of lint per acre				
	Average, 1909–10 to 1913–14	1924–25	1925–26	1926–27	1927–28, preliminary	Average, 1909–10 to 1913–14	1921–25	1925–26	1926–27	1927–28, preliminary
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*
United States	34,152	41,360	46,053	47,087	40,168	182	158	167	183	152
India	22,503	26,801	28,491	24,976	23,178	76	91	88	80	95
Egypt	1,743	1,856	1,998	1,854	1,574	390	388	390	386	380
China		4,848	4,708							
Brazil	[1] 887	1,573	1,320	986		209	184	218	218	
Russia (Asiatic)	1,569	1,247	1,614	1,741	1,973	276	185	218	203	
Mexico	253	520	420	567		353	274	225	334	
Chosen (Korea)	146	422	485	529	502	67	137	123	131	138
Uganda	58	584	617	570	540	108	134	123	85	
Peru	[2] 163	301	284				327	337		
Anglo Egyptian Sudan	44	130	230	216	255	157	150	220	288	236
Argentina	5	258	272	177	173	221	123	237	162	
Total countries reporting 1924–25 to 1926–27		74,751	81,509	78,703						
Estimated world total, excluding China	62,500	77,000	83,400	80,900						

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture. Data for crop year as given at the head of the table are for crops harvested between Aug. 1 and July 31 of the following year. This applies to both Northern and Southern Hemispheres. For the United States prior to 1914 the figures apply to the harvest year beginning Sept. 1.

[1] Average for 3 years. [2] Average 1914–15 to 1918–19.

TABLE 249.—*Cotton: Production of lint in specified countries, average 1909–10 to 1913–14, annual 1922–23 to 1927–28*

Country	Year beginning Aug. 1						
	Average, 1909–10 to 1913–14	1922–23	1923–24	1924–25	1925–26	1926–27	1927–28, preliminary
NORTH AMERICA	*Bales* [1]	*Bales* [1]	*Bales*	*Bales* [1]	*Bales* [1]	*Bales* [1]	*Bales* [1]
United States [2]	13,033,000	9,762,000	10,140,000	13,628,000	16,104,000	17,977,000	12,789,000
Mexico	187,000	201,540	175,380	298,000	202,200	396,000	----------
Total North American countries reporting 1922–23 to 1926–27	----------	9,963,540	10,315,380	13,926,000	16,306,000	18,373,000	----------
SOUTH AND CENTRAL AMERICA AND WEST INDIES							
Peru	110,000	197,115	202,983	205,985	[3] 200,000	247,000	250,000
Ecuador	[4] 297	4,312	11,079	[3] 11,500	[3] 6,100	[3] 6,340	----------
Brazil	387,000	553,000	576,000	605,000	601,500	449,000	----------
Paraguay	[5] 92	5,844	16,265	12,222	11,000	[3] 11,800	----------
Argentina	2,314	25,994	58,846	66,668	134,800	60,000	----------
Guatemala	[6] 75	162	709	1,549	1,600	260	----------
Haiti	[4] 9,300	15,505	15,500	15,300	15,000	----------	----------
Dominican Republic [3]	[7] 992	374	448	----------	----------	----------	----------
Porto Rico	[8] 1,310	1,046	1,020	1,900	1,900	----------	----------
Salvador	----------	----------	----------	11,500	11,000	----------	----------
British West Indies	6,058	5,555	5,329	4,579	4,395	----------	----------
Total South and Central American countries and West India reporting 1922–23 to 1926–27	----------	786,427	865,882	902,924	955,000	774,400	----------
EUROPE							
Italy	5,212	4,600	5,000	4,500	----------	----------	----------
Yugoslavia	922	259	203	385	600	----------	----------
Greece	16,770	8,377	11,135	18,325	14,800	[3] 35,000	----------
Bulgaria	842	964	1,795	2,959	1,700	3,000	4,000
Malta	433	161	100	480	655	[3] 424	----------
Spain	----------	218	314	1,266	[3] 1,218	3,000	----------
Total European countries reporting 1922–23 to 1926–27	----------	9,720	13,344	23,030	18,373	41,424	----------
AFRICA							
Algeria	[9] 1,370	392	793	2,230	5,800	9,000	5,000
Morocco (French)	----------	----------	----------	----------	800	900	----------
French West Africa:							
Dahomey [4]	664	1,448	1,483	[3] 1,483	----------	----------	----------
Ivory Coast [4]	[5] 212	914	1,211	[3] 1,212	----------	----------	----------
French Guinea [4]	[8] 167	346	375	404	461	----------	----------
Senegal	----------	2,075	1,199	1,845	2,767	----------	----------
French Sudan	----------	5,535	----------	4,843	----------	----------	----------
Upper Volta	----------	231	4,612	10,972	11,069	----------	----------
French Togo	2,312	3,538	4,508	7,615	[3] 7,387	[3] 5,677	----------
Nigeria	8,702	14,082	21,368	30,475	39,330	14,900	----------
French Equatorial Africa	----------	1,073	1,172	1,408	----------	----------	----------
Egypt	1,453,000	1,391,000	1,353,000	1,507,000	1,629,000	1,497,000	1,250,000
Anglo-Egyptian Sudan	14,455	23,687	38,221	40,665	110,000	130,000	126,000
Italian Somaliland	[4] 510	1,196	1,750	2,305	5,000	3,000	----------
Eritrea	[4] 1,022	692	1,384	2,780	2,430	3,000	----------
Gold Coast	103	660	837	1,250	----------	----------	----------
Belgian Congo	----------	6,964	15,833	18,450	----------	[3] 18,449	----------
Kenya	552	1,004	1,674	11,281	----------	----------	----------
Uganda	20,338	73,678	107,619	164,046	159,100	101,000	----------
Tanganyika	[4 7] 7,971	6,004	9,568	15,720	18,100	[3] 20,755	14,000

[1] Bales of 478 pounds net.
[2] Linters not included. Production of linters during this period has been: Average 1909–10 to 1913–14, 502,711 bales; 1922–23, 607,779 bales; 1923–24, 668,600 bales; 1924–25, 897,375 bales; 1925–26, 1,114,877 bales; 1926–27, 1,157,861 bales.
[3] From an unofficial source.
[4] Exports.
[5] For season 1915–16.
[6] Average for 2 years.
[7] Average for 4 years.
[8] For 1 year only.
[9] Average for 3 years.

TABLE 249.—*Cotton: Production of lint in specified countries, average 1909–10 to 1913–14, annual 1922–23 to 1927–28*—Continued

Country	Year beginning Aug. 1						
	Average, 1909–10 to 1913–14	1922–23	1923–24	1924–25	1925–26	1926–27	1927–28, preliminary
	Bales	*Bales*	*Bales*	*Bales*	*Bales*	*Bales*	*Bales*
Nyasaland	4, 603	4, 529	3, 377	5, 538	6, 459	1, 000	
Northern Rhodesia	[9] 307	85	307	409			
Southern Rhodesia		2	1, 179	4, 010			
Mozambique	388	1, 504	5, 955	2, 496	2, 500	[3] 2, 200	
Union of South Africa	76	5, 218	7, 000	14, 172	26, 200	9, 000	
Total African countries reporting 1922–23 to 1926–27		1, 525, 520	1, 554, 633	1, 795, 048	2, 011, 306	1, 796, 532	
ASIA							
Cyprus	1, 938	1, 259	1, 680	2, 556	2, 600	4, 000	
Turkey, Asiatic	[8] 102, 116	[3] 30, 000	[3] 57, 000	78, 400	126, 000	97, 000	
Syria		3, 700	8, 300	20, 800	12, 700	7, 000	9, 000
Russia, Asiatic	904, 900	55, 300	196, 400	483, 500	736, 600	738, 000	
Iraq	96	251	837	2, 092	2, 080	[3] 3, 000	
Persia	136, 000						
India	3, 585, 000	4, 247, 000	4, 320, 000	5, 095, 000	5, 230, 000	4, 162, 000	4, 597, 000
China [10]	694, 600	2, 318, 000	1, 993, 000	2, 179, 000	2, 114, 000	1, 584, 000	
Japanese Empire:							
Japan	4, 704	2, 883	2, 316	2, 785	2, 081		
Chosen (Korea)	20, 392	103, 400	110, 046	121, 088	125, 000	145, 000	143, 000
French Indo-China	[4] 13, 800	[11] 12, 084	[11] 9, 086	[11] 10, 470	[11] 10, 977		
Dutch East Indies [12]	18, 242	6, 995	7, 321	[12] 1, 865	[13] 1, 617		
Siam	[4] 3, 653	5, 005	3, 062	4, 336	4, 002		
Total Asiatic countries reporting 1922–23 to 1926–27		6, 758, 910	6, 687, 263	7, 982, 436	8, 348, 980	6, 740, 000	
OCEANIA							
Australia	75	8, 796	10, 042	14, 435	5, 700	4, 000	
New Hebrides	[9] 547	2, 812	1, 828	2, 134			
Total Oceania reporting 1922–23 to 1926–27		8, 796	10, 042	14, 435	5, 700	4, 000	
Total all countries reporting 1922–23 to 1926–27		19, 052, 913	19, 446, 544	24, 643, 873	27, 642, 059	27, 729, 356	
Estimated world total, including China	20, 900, 000	19, 300, 000	19, 700, 000	24, 900, 000	27, 900, 000	28, 000, 000	

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture except as otherwise stated. Data for crop year as given at the head of the table are for crops harvested between Aug. 1 and July 31 of the following year. For the United States prior to 1914 the figures apply to the year beginning Sept. 1.

[3] From an unofficial source.
[4] Exports.
[8] For 1 year only.
[9] Average for 3 years.
[10] For 1922–23 to 1925–26, Chinese Economic Bulletin quoting the Chinese Mill Owners' Association. The figures represent the crop in the most important Provinces where the commercial crop is grown. The average 1909–10 to 1913–14 is the commercial crop of China as estimated by the United States Bureau of the Census.
[11] Annam and Cambodia only.
[12] Includes Java and Madura and the outer possessions.
[13] Java and Madura only.

TABLE 250.—*Cotton: World production of lint, 1909–10 to 1927–28*

Year	Estimated world total, excluding China	Estimated world total, including China	Estimated world total commercial crop [1]	Six principal producing countries: United States	India	Egypt	China [2]	Brazil	Russia (Asiatic)
	1,000 bales [3]	*1,000 bales* [3]	*1,000 bales* [4]	*1,000 bales* [3]	*1,000 bales* [3]	*1,000 bales* [3]	*1,000 bales* [3]	*1,000 bales* [3]	*1,000 bales* [3]
1909–10	16,800		20,859	10,005	3,998	1,036			817
1910–11	18,460		18,856	11,609	3,254	1,555			1,006
1911–12	21,990		22,247	15,693	2,730	1,530		360	969
1912–13	21,190		21,550	13,703	3,702	1,554		418	946
1913–14	22,350		22,612	14,156	4,239	1,588		477	1,104
1914–15	24,270		24,964	16,135	4,359	1,337		465	1,270
1915–16	17,750		18,419	11,192	3,128	989		339	1,512
1916–17	18,370	19,910	18,924	11,450	3,759	1,048	1,534	337	1,199
1917–18	17,660	19,750	18,140	11,302	3,393	1,304	2,092	414	634
1918–19	17,790	20,850	18,755	12,041	3,328	999	3,059	406	161
1919–20	18,730	21,330	20,220	11,421	4,853	1,155	2,599	461	81
1920–21	19,110	20,990	19,665	13,440	3,013	1,251	1,883	476	58
1921–22	13,930	15,450	15,334	7,954	3,753	902	1,517	504	43
1922–23	16,980	19,300	17,959	9,762	4,247	1,391	2,318	553	55
1923–24	17,710	19,700	19,005	10,140	4,320	1,353	1,993	576	196
1924–25	22,720	24,900	23,825	13,628	5,095	1,507	2,179	605	484
1925–26	25,790	27,900	26,618	16,104	5,230	1,629	2,114	602	737
1926–27	26,420	28,000	27,813	17,977	4,162	1,497	1,584	449	738
1927–28 [5]				12,789	4,597	1,250			

Bureau of Agricultural Economics. Data for crop year as given are for crops harvested between Aug. 1 and July 31 of the following year. For the United States prior to 1914 the figures apply to the year beginning Sept. 1.

[1] Figures as reported by the United States Bureau of the Census, including the cotton destined to enter commercial channels for factory purposes. Estimates of the commercial crop in China are included.
[2] Chinese Cotton Mill Owners' Association. Figures represent the crop in the most important cotton-producing Provinces where the commercial crop is grown. Most of the cotton produced in other Provinces is used for home hand-loom consumption.
[3] Bales of 478 pounds net.
[4] American in running bales and foreign cotton in bales of 478 pounds net.
[5] Preliminary.

TABLE 251.—*Cotton: Estimated monthly marketings by farmers, 1916–1926*

Year beginning August	Percentage of year's sales [1]: Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Season
1916	3.9	14.6	23.0	21.6	15.0	6.4	4.0	3.9	3.0	2.5	1.6	0.5	100
1917	2.5	11.3	23.0	22.7	10.2	8.2	5.8	4.5	2.6	1.3	1.0	.9	100
1918	3.3	10.9	18.1	16.4	13.6	5.4	4.4	4.6	4.6	7.5	6.8	4.4	100
1919	1.4	9.5	21.0	22.2	17.4	8.8	5.6	4.9	3.2	2.7	1.7	1.6	100
1920	3.1	10.0	16.2	15.7	11.0	6.4	5.6	6.0	6.7	6.9	6.8	5.6	100
1921	3.6	14.0	22.3	17.1	12.1	5.9	4.3	4.6	4.6	5.9	3.0	2.6	100
1922	5.2	16.8	25.3	19.8	12.8	5.9	4.1	3.7	2.0	1.0	1.5	1.6	100
1923	4.1	16.3	24.6	24.9	13.3	5.8	3.1	2.4	1.7	1.3	.9	1.6	100
1924	3.3	15.2	25.2	22.3	14.5	7.0	5.3	3.4	1.6	1.0	.6	.6	100
1925	6.5	19.3	23.1	17.6	12.0	6.5	4.2	3.1	2.3	1.7	2.1	1.6	100
1926	2.7	15.2	22.0	19.5	12.5	6.3	5.8	5.0	3.8	3.1	2.5	1.6	100

Bureau of Agricultural Economics.

[1] As reported by about 7,500 cotton growers, supplemented by records of State weighers, cooperative associations, and cotton dealers.

TABLE 252.—*Cotton: International trade, average 1910–1914, annual 1924–1927*

Country	Year ended June 30									
	Average, 1910-1914		1924		1925		1926		1927, preliminary	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
PRINCIPAL EXPORTING COUNTRIES	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*	*1,000 bales*
Argentina	(1) (2)	[2] 1	--------	25	--------	24	--------	65	--------	86
Australia	[2] 3	(1) (2)	2	7	4	11	--------	[3] 8	--------	--------
British India	57	2,154	72	3,000	[4] 89	[4] 3,331	[4] 96	[4] 3,218	[4] 312	[4] 2,422
Egypt	(1)	1,444	(1)	1,469	(1)	1,504	(1)	1,409	(1)	1,595
Syria and Lebanon [3]	--------	--------	--------	[5] 7	--------	5	--------	6	--------	4
United States	232	8,840	305	5,784	324	8,239	338	8,110	400	11,281
PRINCIPAL IMPORTING COUNTRIES										
Algeria [3]	(1)	(1)	[5] 1	--------	1	--------	1	--------	1	--------
Austria	[2, 6] 906	[2, 6] 12	128	1	139	1	160	2	142	2
Belgium	[7] 663	[7] 278	328	49	333	15	395	2	362	6
Bulgaria	[2] 4	(1) (2)	--------	--------	(1)	--------	2	--------	[8] 5	--------
Canada	155	--------	180	--------	230	--------	274	--------	206	--------
Ceylon [3]	--------	--------	[5] 5	--------	4	--------	6	--------	3	--------
Cuba	3	(1)	6	--------	7	--------	6	--------	[9] 3	(1)
Czechoslovakia	--------	--------	463	[2] 2	578	26	581	13	540	2
Denmark	[2] 26	(1)	23	--------	21	--------	21	--------	15	--------
Estonia [3]	--------	--------	[5] 14	--------	21	--------	21	--------	24	--------
Finland	[2] 37	--------	36	--------	28	--------	40	--------	41	--------
France	1,440	337	1,344	93	1,540	91	1,565	88	1,602	138
Germany	2,142	221	1,121	97	1,467	163	1,587	205	1,812	280
Greece	[2] 10	(1)	[3, 5] 6	--------	[3] 10	--------	[3, 10] 1	--------	--------	--------
Hungary	--------	--------	12	(1)	11	(1)	20	(1)	28	--------
Italy	902	(1)	894	2	1,073	3	1,023	2	1,037	1
Japan	[2] 1,405	--------	[3] 2,260	--------	2,669	--------	3,233	--------	3,485	--------
Latvia [3]	--------	--------	[5] 3	--------	5	--------	6	--------	6	--------
Netherlands	[2] 277	[2] 145	78	4	148	2	160	2	186	3
Norway	[2] 18	--------	12	--------	14	--------	10	--------	11	--------
Poland	--------	--------	[3] 186	--------	225	(1)	199	(1)	327	(1)
Rumania	[2] 2	--------	10	(1)	9	(1)	3	--------	--------	--------
Spain	388	1	328	1	430	1	418	3	[8] 169	[8] 8
Sweden	[2] 93	[2] 1	96	--------	89	--------	97	--------	114	--------
Switzerland	[2] 113	--------	[3] 126	--------	137	--------	138	--------	157	--------
United Kingdom	4,143	--------	2,742	--------	3,654	--------	3,345	--------	3,728	--------
Total, 32 countries	13,019	13,434	10,731	10,546	13,260	13,416	13,740	13,133	14,896	15,828

Bureau of Agricultural Economics. Official sources except where otherwise noted. Bales of 500 pounds gross weight or 478 pounds net. The figures for cotton refer to ginned and unginned cotton and linters, but not to mill waste, cotton batting, scarto (Egyptian and Sudan). Wherever unginned cotton has been separately stated in the original reports it has been reduced to ginned cotton in this statement at the ratio of 3 pounds unginned to 1 pound ginned.

[1] Less than 500 bales.
[2] Year ended Dec. 31.
[3] International Crop Report and Agricultural Statistics.
[4] Sea trade only.
[5] 11 months.
[6] Average for Austria-Hungary.
[7] 3-year average.
[8] 9 months.
[9] 6 months.
[10] 2 months.

TABLE 253.—*Cotton: Estimated price per pound, received by producers, United States, 1909–1927*

Year beginning August	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	July 15	Weighted av.
	Cts.	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
Average:													
1909–1913	12.3	12.2	12.1	12.1	12.2	12.2	12.3	12.4	12.4	12.7	12.7	12.7	12.2
1914–1920	21.7	21.1	21.1	20.8	20.2	19.9	19.5	19.7	20.1	20.4	21.2	21.8	20.4
1921–1925	21.4	21.4	22.5	22.1	22.4	22.7	22.9	22.5	22.5	22.1	22.5	22.3	22.2
1909	11.5	12.2	13.2	13.8	14.2	14.3	14.0	14.0	14.0	14.1	14.0	14.1	13.6
1910	14.4	13.8	13.6	14.0	14.2	14.4	14.1	13.9	14.0	14.4	14.5	13.8	14.0
1911	12.5	11.0	9.6	8.8	8.6	8.7	9.4	10.0	10.5	11.0	11.1	11.6	9.6
1912	11.6	11.2	11.0	11.4	12.0	12.0	11.8	11.8	11.7	11.6	11.6	11.6	11.5
1913	11.6	12.6	13.2	12.6	12.0	11.8	12.2	12.2	12.0	12.3	12.4	12.4	12.5
1914	10.6	8.2	7.0	6.6	6.7	7.0	7.4	7.8	8.6	8.8	8.6	8.4	7.4
1915	8.3	9.8	11.4	11.4	11.4	11.4	11.3	11.3	11.5	11.8	12.4	12.6	11.2
1916	13.6	15.0	16.8	18.8	18.4	17.0	16.4	17.0	18.4	19.6	22.4	24.5	17.3
1917	23.8	23.4	25.3	27.5	28.3	29.3	30.0	31.0	30.2	28.0	28.0	28.2	27.1
1918	30.0	32.0	30.6	28.4	28.2	26.8	24.4	24.2	25.2	27.8	30.3	31.8	28.8
1919	31.4	30.8	33.9	36.0	35.8	36.0	36.2	36.8	37.5	37.4	37.3	37.1	35.2
1920	34.0	28.3	22.4	16.6	12.7	11.6	11.0	9.8	9.4	9.6	9.7	9.7	15.8
1921	11.2	16.2	18.8	17.0	16.2	15.9	15.7	16.0	16.0	17.3	19.6	20.6	17.0
1922	20.9	20.6	21.2	23.1	24.2	25.2	26.8	28.0	27.6	26.2	25.9	24.8	22.8
1923	23.8	25.6	28.0	29.9	32.1	32.5	31.4	27.7	28.7	28.1	27.8	27.3	28.7
1924	27.8	22.2	23.1	22.5	22.2	22.7	23.0	24.5	23.7	23.0	23.0	23.4	22.9
1925	23.4	22.5	21.5	18.1	17.4	17.4	17.6	16.5	16.6	16.0	16.1	15.4	19.6
1926	16.1	16.8	11.7	11.0	10.0	10.6	11.5	12.5	12.3	13.9	14.8	15.5	12.5
1927	17.1	22.5	21.0	20.0	18.7								

Bureau of Agricultural Economics. Based upon returns from special price reporters. Mean of prices reported on 1st of month and 1st of succeeding month, August, 1909–December, 1923.

TABLE 254.—*Cotton, middling: Average spot price per pound at 10 markets*

NORFOLK

Year beginning August	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1920	37.00	29.05	21.23	17.34	14.46	14.85	12.80	11.37	11.20	11.60	10.78	11.31	16.92
1921	12.57	19.10	18.66	17.12	17.28	16.96	16.83	17.27	17.12	19.46	21.44	22.17	18.00
1922	21.50	20.99	22.48	25.40	25.44	27.59	28.75	30.08	28.13	26.22	27.89	25.96	25.87
1923	24.20	27.70	28.65	33.16	34.18	33.65	31.79	28.41	30.37	30.37	29.31	29.91	30.15
1924	27.31	23.08	23.56	23.85	23.59	23.68	24.65	25.50	24.43	23.85	24.20	24.89	24.38
1925	23.39	23.39	20.86	19.87	19.18	20.07	19.82	18.63	18.26	18.10	17.77	17.98	19.78
1926	17.79	16.11	12.43	12.28	11.91	12.87	13.73	14.00	14.27	15.43	16.24	17.04	14.56
1927	19.46	21.50	20.95	20.25	19.43								

AUGUSTA

1920	35.03	28.17	21.60	17.75	14.62	14.46	12.67	10.82	11.00	11.36	10.62	11.29	16.62
1921	12.83	19.49	18.74	16.93	17.17	16.74	16.60	17.09	16.88	19.30	21.49	22.38	17.07
1922	21.55	20.93	22.38	25.18	25.46	27.66	28.78	30.07	28.14	26.84	28.15	25.81	25.92
1923	24.63	27.76	28.75	33.16	34.28	33.55	31.61	28.73	30.08	30.06	29.19	28.94	30.06
1924	27.08	22.72	23.29	23.77	23.44	23.50	24.43	25.30	24.48	23.75	24.44	24.68	24.24
1925	23.14	23.10	20.50	19.64	19.06	19.95	19.38	18.22	17.83	17.79	17.55	18.16	19.53
1926	17.56	15.68	12.20	12.17	11.69	12.68	13.49	13.79	14.05	15.31	16.20	17.59	14.37
1927	19.37	21.55	20.60	20.08	19.28								

SAVANNAH

1920	34.69	28.74	22.12	18.38	15.68	15.62	13.95	11.75	11.48	11.83	10.90	11.31	17.20
1921	12.74	19.64	19.30	17.17	17.39	17.06	16.72	17.36	17.01	19.39	21.52	22.09	18.12
1922	21.29	20.88	22.37	25.19	25.61	27.58	28.75	30.11	28.16	26.44	28.29	25.74	25.87
1923	24.45	27.85	28.77	33.09	34.18	33.38	31.54	28.27	30.03	30.14	29.13	29.12	30.00
1924	26.74	22.89	23.59	24.00	23.70	23.68	24.58	25.46	24.39	23.42	24.22	24.52	24.27
1925	23.19	23.19	20.70	19.76	19.20	19.93	19.46	18.27	18.05	17.09	17.56	17.97	19.61
1926	17.55	15.82	12.30	12.15	11.79	12.74	13.66	13.99	14.24	15.53	16.30	17.48	14.46
1927	19.32	21.52	20.58	20.04	19.33								

TABLE 254.—*Cotton, middling: Average spot price per pound at 10 markets*—Continued

MONTGOMERY

Year beginning August	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1920	36.38	27.84	21.24	17.97	14.40	13.86	12.32	10.39	10.53	10.89	10.09	10.53	16.37
1921	11.89	18.73	18.46	16.68	16.92	16.46	16.18	16.55	16.15	18.66	21.08	22.05	17.48
1922	21.28	20.17	21.75	24.86	25.02	27.05	28.61	29.81	27.85	25.97	27.86	25.70	25.49
1923	24.23	27.61	28.68	32.87	34.00	33.34	31.50	28.34	29.81	29.78	28.95	28.67	29.82
1924	26.36	22.05	22.67	23.09	22.76	23.04	23.97	24.75	24.10	23.54	24.08	24.09	23.71
1925	22.59	22.47	20.13	19.10	18.60	19.44	18.87	17.63	17.40	17.21	16.96	17.41	18.98
1926	17.26	15.25	11.64	11.57	11.22	12.11	12.91	13.19	13.61	14.82	15.64	16.96	13.85
1927	18.79	20.78	19.95	19.40	18.78								

MEMPHIS

1920	36.35	31.00	21.68	18.28	14.75	14.46	13.48	11.65	11.25	11.63	11.06	10.82	17.20
1921	12.17	19.46	19.71	18.27	18.15	17.80	17.01	17.28	17.00	19.19	21.79	22.72	18.38
1922	22.07	21.19	22.09	25.31	25.80	27.68	28.74	30.63	29.02	26.89	28.58	26.51	26.21
1923	24.08	27.73	29.28	33.54	34.67	34.07	32.31	28.92	30.35	30.64	30.05	29.42	30.42
1924	27.37	23.10	23.24	23.55	23.61	23.54	24.29	25.56	24.40	23.34	24.00	24.28	24.19
1925	23.69	23.26	21.50	20.20	19.47	19.79	19.90	18.43	18.01	17.93	17.36	17.66	19.77
1926	17.83	16.14	12.69	12.42	11.85	12.56	13.15	13.47	13.78	15.03	15.76	17.04	14.31
1927	18.95	20.70	19.92	19.61	18.83								

LITTLE ROCK

1920	34.89	28.28	21.38	18.23	14.96	14.45	13.35	11.49	10.63	11.35	10.68	10.58	16.69
1921	11.81	19.60	19.75	18.12	17.84	17.57	16.90	16.89	16.87	18.90	21.17	22.07	18.12
1922	21.47	20.76	21.80	25.22	25.53	27.15	28.46	30.02	28.24	26.41	27.88	26.39	25.78
1923	24.20	27.64	29.10	33.55	34.41	33.94	31.76	28.70	30.15	30.20	29.50	29.48	30.22
1924	27.11	22.55	23.24	23.33	23.34	23.62	24.57	25.59	24.82	23.69	24.52	24.86	24.27
1925	23.51	23.44	21.40	20.30	19.56	20.03	19.31	17.91	17.98	17.85	17.26	17.89	19.70
1926	17.67	16.19	12.52	12.13	11.71	12.68	13.30	13.46	13.85	15.30	15.76	16.94	14.29
1927	18.85	20.73	20.12	19.35	18.70								

DALLAS

1920	32.74	26.40	20.69	17.08	13.70	13.63	12.16	10.64	10.53	11.20	10.23	10.50	15.79
1921	12.11	19.25	19.17	17.10	17.12	16.75	16.44	16.93	16.70	19.08	21.37	22.05	17.84
1922	21.19	20.14	21.67	24.75	24.79	26.08	27.86	29.88	27.79	25.87	27.72	25.34	25.31
1923	23.40	27.05	28.51	32.92	33.94	33.25	31.14	27.89	29.84	20.88	28.84	29.20	20.66
1924	27.33	22.11	22.73	22.95	22.74	23.10	24.32	25.47	24.37	23.28	23.93	24.56	23.91
1925	23.28	23.38	21.13	20.02	19.15	19.68	19.40	18.23	18.03	17.93	17.49	17.92	19.64
1926	17.48	15.60	11.85	11.52	11.30	12.26	12.91	13.18	13.58	14.84	15.59	16.86	13.91
1927	18.51	20.56	19.59	18.97	18.15								

HOUSTON

1920	32.94	27.33	20.08	17.56	14.16	13.95	12.62	10.95	10.89	11.85	11.02	11.69	16.33
1921	13.06	20.02	19.64	17.65	17.73	17.20	17.05	17.51	17.24	19.67	22.18	22.51	18.46
1922	21.59	20.69	22.20	25.33	25.45	27.51	28.71	30.54	28.59	26.65	28.42	25.62	25.94
1923	24.23	27.78	29.00	33.46	34.03	33.85	31.79	28.60	30.55	30.61	29.55	29.29	30.28
1924	27.69	23.03	23.53	23.92	23.55	23.71	24.88	26.03	25.04	23.82	24.11	24.70	24.50
1925	23.71	23.33	21.20	20.23	19.78	20.52	20.04	18.76	18.37	18.30	17.77	17.96	20.00
1926	17.69	16.43	12.82	12.47	12.18	13.06	13.72	14.04	14.47	15.80	16.46	17.60	14.73
1927	19.46	21.50	20.49	19.81	19.06								

GALVESTON

1920	33.78	28.15	21.98	18.10	15.00	14.38	12.99	11.76	11.47	12.01	11.27	11.80	16.89
1921	13.33	20.33	20.05	17.99	17.92	17.32	17.10	17.58	17.40	19.75	22.23	22.67	18.64
1922	21.79	20.77	22.28	25.37	25.48	27.54	28.81	30.52	28.63	26.75	28.57	25.87	26.03
1923	24.44	27.80	29.11	33.62	34.70	33.95	31.92	28.85	30.91	30.82	29.74	29.94	30.48
1924	28.01	23.12	23.56	23.92	23.59	23.72	24.78	26.00	25.04	23.92	24.34	24.83	24.57
1925	23.88	23.50	21.26	20.24	19.80	20.69	20.29	18.94	18.52	18.35	17.90	18.05	20.12
1926	17.72	16.40	12.88	12.52	12.26	13.13	13.76	14.08	14.49	15.82	16.67	17.67	14.79
1927	19.40	21.53	20.58	19.88	19.11								

TABLE 254.—*Cotton, middling: Average spot price per pound at 10 markets*—Continued

NEW ORLEANS

Year beginning August	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1909	12.28	12.66	13.48	14.40	14.96	15.23	14.88	14.74	14.64	14.80	14.85	14.93	14.33
1910	14.92	13.49	14.21	14.50	14.85	14.95	14.62	14.54	14.70	15.48	15.26	14.30	14.65
1911	11.96	11.29	9.61	9.35	9.17	9.53	10.31	10.65	11.61	11.72	12.07	12.93	10.85
1912	12.07	11.37	10.95	12.15	12.81	12.58	12.61	12.45	12.44	12.29	12.44	12.34	12.20
1913	12.02	13.11	13.73	13.26	12.98	12.93	12.90	12.95	13.11	13.36	13.79	13.34	13.12
1914	(1)	[2] 8.42	7.02	7.43	7.18	7.87	8.01	8.34	9.43	9.04	9.12	8.71	------
1915	8.94	10.40	11.95	11.50	11.89	12.04	11.45	11.73	11.88	12.61	12.80	13.03	11.68
1916	14.26	15.27	17.24	19.45	18.34	17.33	17.14	17.94	19.51	20.06	24.18	25.41	18.84
1917	25.07	21.68	26.76	28.07	29.07	31.07	30.91	32.76	33.05	28.90	30.71	29.50	28.96
1918	30.23	33.22	31.18	29.75	29.44	28.84	26.97	26.84	26.70	29.22	32.09	33.93	29.87
1919	31.38	30.38	35.28	39.58	39.89	40.28	39.39	40.69	41.41	40.31	40.49	39.41	38.21
1920	34.03	27.48	20.95	17.65	14.59	14.53	12.85	11.08	11.17	11.80	11.03	11.49	16.55
1921	12.78	19.35	18.99	17.27	17.16	16.53	16.36	16.74	16.80	19.31	21.68	22.01	17.92
1922	21.55	20.74	22.05	25.34	25.48	27.51	28.78	30.43	28.42	26.63	28.61	25.73	25.94
1923	24.22	27.71	29.18	33.68	34.88	33.93	31.90	28.74	30.41	30.70	29.43	29.23	30.33
1924	26.65	22.79	23.48	23.95	23.66	23.66	24.61	25.52	24.52	23.54	24.07	24.05	24.21
1925	23.07	23.09	20.86	19.82	19.27	20.26	19.83	18.35	18.11	18.06	17.54	18.24	19.71
1926	18.01	16.14	12.68	12.52	12.22	13.17	13.82	14.10	14.42	15.68	16.47	17.63	14.74
1927	19.36	21.53	20.73	19.99	19.26	------	------	------	------	------	------	------	------

TEN MARKETS COMBINED

Year beginning August	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Average
1915	[3] 8.80	10.29	11.99	11.49	11.97	12.10	11.64	11.78	11.94	12.67	12.89	13.11	11.72
1916	14.32	15.31	17.38	19.54	18.44	17.70	[4] 16.54	18.29	19.72	20.15	24.33	25.45	18.96
1917	25.26	22.08	26.86	28.21	29.19	31.05	30.97	32.81	32.87	29.32	30.10	29.44	29.02
1918	31.05	33.38	31.11	29.27	29.22	28.51	26.55	26.40	26.84	29.21	31.84	33.80	29.76
1919	31.50	30.30	35.44	39.59	39.70	40.46	39.49	40.68	41.74	41.01	40.58	39.58	38.34
1920	34.78	28.24	21.38	17.83	14.63	14.42	12.93	11.19	11.01	11.55	10.77	11.13	16.66
1921	12.53	19.50	19.25	17.43	17.47	17.04	16.73	17.12	16.92	19.22	21.58	22.27	18.09
1922	21.53	20.72	22.11	25.20	25.40	27.39	28.62	30.21	28.28	26.47	28.20	25.87	25.83
1923	24.22	27.67	28.90	33.30	34.39	33.69	31.73	28.54	30.25	30.32	29.37	29.32	30.14
1924	27.16	22.74	23.29	23.63	23.40	23.53	24.51	25.51	24.56	23.61	24.19	24.55	24.22
1925	23.35	23.23	20.95	19.02	19.31	20.04	19.83	18.33	18.05	17.05	17.52	17.92	19.68
1926	17.65	15.96	12.40	12.17	11.81	12.72	13.45	13.74	14.08	15.38	16.10	17.34	14.40
1927	19.16	21.19	20.35	19.74	18.99	------	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Prior to Aug. 16, 1915, compiled from quotations in Market Reports of the New York Cotton Exchange, except Sept. 23 to Nov. 16, 1914, when the exchange was closed, quotations for which time were taken from the New York Commercial and Financial Chronicle; from Aug. 16, 1915, compiled from daily reports to the bureau from the cotton exchanges of the various markets. Prices 1900–1908 for New Orleans and 1914–1919 for other markets are available in 1924 Yearbook, p. 756, Table 313, and p. 757, Table 314.

[1] Market closed. [2] No quotations prior to Sept. 23. Average for 7 day's business.
[3] Does not include New Orleans. [4] Does not include Savannah.

TABLE 255.—*Cotton: Average spot price per pound in specified foreign markets, 1912–1927*

LIVERPOOL, AMERICAN MIDDLING [1]

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Average
	Cts.	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
1912	13.83	13.55	12.50	13.82	14.31	14.00	13.97	13.97	14.00	13.58	13.67	13.61	13.75
1913	13.38	15.10	15.55	14.94	14.54	14.34	14.25	14.28	15.02	15.20	15.71	14.74	14.75
1914	13.23	12.22	10.53	9.25	8.93	9.77	10.06	10.46	11.37	10.42	10.47	10.32	10.50
1915	10.79	12.24	13.90	13.74	15.03	15.99	15.61	15.48	15.47	16.77	16.17	15.94	14.79
1916	17.54	18.90	20.69	23.05	22.16	21.76	21.34	24.07	25.23	26.17	34.07	37.65	24.39
1917	38.21	35.96	34.85	43.38	44.25	46.16	45.88	47.19	46.52	42.28	43.89	43.09	[illegible]
1918	45.26	48.44	46.46	43.97	42.30	37.66	34.53	30.30	33.21	35.70	38.25	38.33	39.51
1919	34.06	32.20	38.06	41.99	40.92	43.61	41.61	45.16	44.17	42.51	44.48	41.88	40.88
1920	38.31	31.33	24.41	19.18	14.74	15.32	12.71	11.78	12.07	12.53	11.66	11.94	18.09
1921	13.34	20.70	20.85	18.46	18.84	18.12	17.75	19.21	18.89	21.42	23.46	24.93	19.67
1922	24.90	28.98	24.55	27.96	28.26	30.64	30.93	31.42	30.29	28.43	31.57	29.23	28.51
1923	28.18	31.99	31.98	35.74	36.00	34.33	32.53	29.77	33.15	32.00	30.74	30.38	31.90
1924	31.62	25.06	28.13	26.09	25.73	25.90	27.17	27.95	26.85	25.83	27.34	27.76	26.12
1925	26.28	26.25	23.17	21.51	20.51	21.63	21.40	20.32	20.31	20.73	19.98	19.76	21.82
1926	19.69	19.35	14.51	14.08	13.34	14.55	15.56	15.65	16.24	17.90	18.55	19.42	16.57
1927	21.10	24.17	23.36	22.73	21.98	------	------	------	------	------	------	------	------

[1] International Yearbook of Agricultural Statistics, 1921, p. 443. London Economist, 1922 to date. Average of weekly quotations.

TABLE 255.—*Cotton: Average spot price per pound in specified foreign markets, 1912–1927*—Continued

LIVERPOOL, EGYPTIAN UPPERS, GOOD [2]

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Average
	Cts.	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
1912	20. 2	19. 1	18. 3	18. 9	19. 3	19. 9	20. 1	20. 2	20. 3	20. 2	19. 7	19. 0	19. 6
1913	18. 8	20. 0	20. 2	20. 0	19. 5	18. 9	17. 9	17. 3	17. 9	18. 1	18. 2	17. 6	18. 7
1914	16. 5	16. 1	13. 5	12. 6	12. 2	12. 2	12. 8	14. 0	15. 5	14. 5	14. 4	13. 8	14. 0
1915	14. 1	15. 4	18. 1	17. 9	18. 6	21. 9	22. 5	22. 4	21. 6	22. 4	23. 5	23. 7	20. 2
1916	23. 7	27. 2	31. 2	39. 5	39. 6	39. 7	41. 9	44. 5	50. 5	52. 0	55. 4	60. 3	42. 1
1917	60. 9	52. 0	46. 7	51. 6	54. 4	53. 8	51. 5	54. 9	56. 3	54 0	52. 6	51. 4	53. 6
1918	55. 8	55. 4	51. 3	51. 7	50. 4	50. 3	50. 0	49. 3	48. 3	48. 3	58. 4	46. 4	50. 7
1919	48. 8	48. 8	53. 4	67. 0	76. 3	94. 0	105. 0	108. 7	107. 6	97. 1	81. 3	71. 6	80. 0
1920	68. 6	53. 4	37. 0	29. 4	23. 4	24. 6	20. 8	19. 6	21. 5	18. 8	18. 8	18. 0	29. 5
1921	18. 6	29. 3	33. 3	28. 3	29. 4	28. 8	27. 4	28. 4	26. 8	28. 1	29. 7	29. 4	28. 1
1922	28. 1	27. 4	27. 3	30. 7	31. 2	31. 9	32. 5	33. 9	33. 6	30. 4	31. 9	31. 0	30. 8
1923	31. 5	33. 4	33. 5	39. 6	41. 5	39. 7	39. 0	37. 5	41. 2	43. 9	43. 3	43. 6	39. 0
1924	45. 6	35. 5	34. 3	35. 4	37. 5	40. 3	41. 3	45. 1	43. 6	42. 1	41. 6	41. 4	40. 3
1925	39. 5	37. 1	35. 0	32. 6	30. 8	29. 9	28. 5	26 2	25. 9	27. 3	26. 2	25. 2	30. 4
1926	26. 0	28. 0	23. 8	22. 2	19. 4	21. 8	24. 3	23. 5	23. 3	26. 7	28. 3	30. 2	24. 8
1927	32. 0	33. 2	31. 8	31. 3	29. 9								

LIVERPOOL, NO. 1 OOMRAS, FULLY GOOD [2]

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Average
1912	12. 2	11. 9	11. 6	12. 1	12. 5	12. 7	12. 8	12. 7	12. 5	12. 2	11. 9	11. 8	12. 2
1913	11. 6	12. 9	12. 9	12. 8	12. 5	12. 0	11. 5	11. 5	11. 5	11. 4	11. 0	10. 6	11. 8
1914	9. 7	9. 1	8. 8	7. 9	7. 7	8. 5	8. 4	8. 5	9. 2	8. 9	9. 1	8. 9	8. 7
1915	9. 1	9. 7	10. 9	10. 7	11. 9	12. 6	12. 4	12. 1	11. 9	13. 0	12. 8	12. 9	10. 7
1916	14. 2	15. 0	15. 8	17. 6	16. 6	16. 9	17. 3	20. 2	21. 0	22. 1	31. 2	33. 4	20. 1
1917	34. 2	31. 9	36. 9	37. 6	37. 2	38. 2	37. 6	38. 2	38. 2	35. 2	36. 8	36. 8	36. 6
1918	37. 8	44. 1	42. 4	37. 5	34. 3	35. 3	32. 6	27. 7	28. 9	30. 1	32. 4	32. 2	34. 6
1919	30. 7	29. 0	30. 5	32. 1	32. 0	32. 6	30. 0	32. 3	31. 8	30. 2	29. 1	26. 1	30. 5
1920	23. 8	21. 6	18. 5	15. 7	12. 0	11. 9	10. 6	9. 2	9. 4	9. 8	9. 2	9. 3	13. 4
1921	10. 5	16. 0	16. 9	15. 3	15. 4	15. 3	14. 9	15. 4	16. 0	15. 7	18. 9	19. 7	15. 8
1922	19. 8	18. 9	18. 8	20. 6	20. 5	21. 9	22. 2	21. 7	20. 7	19. 4	20. 8	20 2	20. 5
1923	19. 6	21. 8	22. 0	25. 9	27. 7	26. 1	25. 2	22. 4	24. 0	22. 9	22. 6	22. 0	23. 5
1924	23. 4	19. 7	22. 3	23. 3	23. 5	22. 6	23. 5	23. 2	22. 2	21. 2	21. 6	22. 0	22. 4
1925	21. 5	22. 0	19. 9	18. 1	16. 8	17. 4	16. 8	15. 4	15. 1	15. 6	15. 0	15. 2	17. 4
1926	15. 5	15. 4	12. 5	12. 1	11. 5	12. 5	13. 3	13. 4	13. 9	15. 4	16. 2	17. 0	14. 1
1927	17. 8	20. 1	19. 3	17. 7	17. 6								

Bureau of Agricultural Economics.

[2] London Economist, average of weekly quotations to August, 1925, inclusive. Subsequently from Liverpool Cotton Association Daily Report.

TABLE 256.—*Cottonseed: Production and estimated price per ton, December 1, by States, 1921–1927*

State	Production, year beginning August [1]—							Estimated price per ton						
	1921	1922	1923	1924	1925	1926	1927	1921	1922	1923	1924	1925	1926	1927
	1,000 short tons	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
Missouri	31	66	57	85	133	97	46	27. 00	36. 30	38. 60	32. 40	30. 00	16. 80	36. 90
Virginia	7	12	22	17	23	23	14	30. 00	34. 50	43. 30	30. 30	35. 00	26. 00	42. 00
North Carolina	345	378	452	366	488	539	381	31. 30	39. 30	44. 60	35. 00	33. 00	22. 00	37. 00
South Carolina	335	218	341	357	294	448	326	32. 00	41. 30	48. 00	36. 10	32. 00	21. 00	39. 50
Georgia	349	317	261	445	516	604	488	30. 70	39. 70	47. 00	34. 10	33. 00	21. 00	38. 50
Florida	5	12	6	10	17	14	8	27. 60	35. 30	43. 20	32. 10	34. 00	19. 00	30. 50
Tennessee	134	174	101	157	229	200	153	29. 30	41. 40	49. 70	35. 20	25. 50	19. 00	37. 00
Alabama	258	366	260	438	602	665	533	30. 10	36. 60	47. 60	34. 30	29. 00	19. 60	37. 00
Mississippi	361	439	268	487	884	833	505	29. 20	36. 30	49. 30	35. 70	22. 00	21. 00	38. 50
Arkansas	354	449	276	[illegible]	711	687	435	27. 00	35. 30	44. 40	33. 20	18. 30	17. 50	36. 50
Louisiana	124	152	163	[illegible]	404	368	242	27. 00	32. 30	40. 70	29. 20	24. 50	18. 00	33. 00
Oklahoma	214	279	291	671	751	787	440	27. 20	29. 70	37. 70	28. 60	26. 50	15. 40	37. 00
Texas	976	1, 433	1, 927	2, 197	1, 349	2, 499	1, 900	27. 30	33. 50	40. 10	31. 10	28. 50	17. 50	36. 00
New Mexico	3	5	14	25	30	33	31	22. 00	30. 00	40. 50	30. 00	28. 00	18. 00	30. 00
Arizona	20	21	31	48	53	54	41	20. 00	25. 30	40. 70	21. 20	26. 60	18. 00	30. 00
California	15	12	24	35	51	58	42	15. 00	40. 00	50. 00	40. 00	40. 00	20. 00	37. 50
All other	1	3	4	6	11	8	8	28. 78	35. 67	48. 00	34. 00	36. 00	20. 00	37. 33
United States	3, 531	4, 336	4, 502	6, 051	7, 150	7, 982	5, 678	28. 78	35. 67	43. 00	32. 39	27. 27	18. 68	36. 80

Bureau of Agricultural Economics.

[1] Compiled from reports of Bureau of the Census. Estimated production of lint, by States (December preliminary estimate for 1927), in rounded thousands of 500 pounds gross weight bales, adjusting for net weight and assuming 65 pounds of cottonseed for each 35 net pounds of lint.

TABLE 257.—*Cottonseed and cottonseed products: Production in the United States, 1909–1927*

Year beginning August	Cottonseed		Crude cottonseed products		
	Produced [1]	Crushed	Oil	Cake and meal	Hulls
	1,000 short tons	*1,000 short tons*	*1,000 gallons*	*1,000 short tons*	*1,000 short tons*
1909	4,462	3,269	131,000	1,326	1,289
1910	5,175	4,106	167,970	1,792	1,375
1911	6,997	4,921	201,650	2,151	1,642
1912	6,104	4,580	185,750	1,999	1,540
1913	6,305	4,848	193,330	2,220	1,400
1914	7,186	5,780	229,260	2,648	1,677
1915	4,992	4,202	167,110	1,923	1,220
1916	5,113	4,479	187,688	2,225	969
1917	5,040	4,252	174,996	2,068	996
1918	5,360	4,479	176,711	2,170	1,137
1919	5,074	4,013	161,529	1,817	1,143
1920	5,971	4,069	174,558	1,786	1,256
1921	3,531	3,008	124,063	1,355	937
1922	4,336	3,242	133,723	1,487	944
1923	4,502	3,308	130,616	1,518	911
1924	6,051	4,605	187,171	2,126	1,331
1925	7,150	5,558	215,602	2,597	1,547
1926	7,982	6,306	251,721	2,810	1,854
1927, preliminary	5,678				

Bureau of Agricultural Economics. Compiled from reports of the Bureau of the Census. Production for cottonseed, 1926 and 1927, estimates of the Department of Agriculture.

[1] Production of cottonseed relates to the preceding crop year.

TABLE 258.—*Cottonseed: Estimated price per ton, received by producers, United States, 1910–1927*

Year beginning August	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	July 15	Weighted average
Average:	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1910–1913	19.57	20.75	20.91	20.77	21.81	21.90	21.95	22.21	22.70	22.53	21.94	21.47	21.10
1914–1920	43.27	41.94	46.14	48.12	47.41	47.11	47.46	47.20	47.87	47.82	46.69	45.96	45.70
1921–1925	33.39	31.73	33.70	35.29	36.12	36.57	36.96	37.61	39.65	39.35	37.87	37.03	34.31
1910		26.23	26.86	25.36	25.65	26.35	25.61	25.49	26.12	25.46	23.58	22.70	25.82
1911	20.45	18.09	16.73	16.69	16.70	16.57	16.81	18.21	18.62	19.21	19.21	19.01	17.08
1912	18.02	17.61	18.04	18.57	21.42	21.98	22.01	21.55	21.89	21.88	21.54	21.37	19.10
1913	20.24	21.07	22.01	22.46	23.48	22.70	23.37	23.60	24.17	23.56	23.62	22.78	22.39
1914	20.16	13.88	15.28	14.01	17.73	19.14	23.33	22.32	22.69	22.07	20.82	20.05	16.50
1915	20.14	20.98	33.73	31.01	35.54	36.85	36.75	30.56	38.13	37.91	35.70	36.06	32.65
1916	35.22	41.13	47.19	55.82	56.35	52.53	51.43	53.18	55.91	55.61	57.19	56.90	49.13
1917	56.61	57.58	65.62	69.38	68.29	67.51	66.95	68.27	68.08	68.16	66.03	64.11	66.15
1918	61.34	67.90	65.85	64.97	65.05	64.93	64.65	64.00	64.28	63.83	63.80	61.24	65.23
1919	66.23	62.13	66.95	72.65	69.07	69.88	69.34	67.18	68.71	69.88	66.16	61.64	67.27
1920	43.22	29.96	28.94	26.00	19.83	18.96	19.76	18.92	17.23	17.28	17.06	18.75	22.95
1921	22.06	27.19	31.05	29.15	28.78	29.21	30.17	32.72	40.79	40.21	37.71	36.92	29.72
1922	32.44	25.37	31.79	40.18	42.92	43.35	45.16	46.32	47.60	46.58	43.14	41.42	34.70
1923	37.47	40.88	40.90	45.92	45.54	44.37	43.27	41.34	40.42	40.53	39.96	39.07	42.23
1924	38.44	31.74	31.95	33.57	35.48	37.50	37.14	38.21	37.94	38.61	36.66	36.41	34.08
1925	36.52	33.48	32.82	27.64	27.87	28.40	29.06	29.47	31.51	30.84	31.89	31.31	30.82
1926	29.73	27.38	20.06	18.66	18.05	18.55	22.39	25.43	25.80	26.05	26.27	26.59	21.55
1927	25.95	34.41	36.60	37.51	37.14								

Bureau of Agricultural Economics. Based upon returns from special-price reporters.

TABLE 259.—*Cottonseed oil: International trade, average 1909–1913, annual 1923–1926*

Country	Year ended Dec. 31									
	Average, 1909–1913		1923		1924		1925		1926, preliminary	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
PRINCIPAL EXPORTING COUNTRIES	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Brazil	4,680	[1] 12	39	2,681	6	463	69	1,639	[2] 25	[2] 97
China		2,110		1,336		1,374		4,903		
Egypt	1,927	3,568	21	25,198	34	16,085	391	8,101	1	30,532
Peru		[2, 3] 158		5,243		10,083		7,309		10,601
United Kingdom	44,246	53,920	16,809	46,274	16,524	50,180	11,198	44,092	24,940	50,082
United States	[4] 4,715	202,257	25	49,608		43,343		62,415		40,901
PRINCIPAL IMPORTING COUNTRIES										
Algeria	2,728	1,177	7	16	85	17	[2] 3	[2] 46	[2] 53	[2] 68
Argentina	7,510	12	4,791		517		1,838	2	[2] 768	[2] 10
Australia	1,062		[5] 904	[5] 3	[5] 488	[5] 115	[2] 502	[2] 118	[2] 1,300	
Belgium	16,884	8,143	2,387	8	2,166	(6)	2,689		1,983	7
Canada	21,131		25,613		20,495		29,292		29,321	
Czechoslovakia			37		1,214	[2] 52	281	(6)	314	
Denmark	[3] 7,081		3,813	1,856	3,466	1,180	4,721	[2] 287	8,398	558
France	24,666	2,509	6,404	374	7,225	92	7,910	35	8,901	30
Germany	51,884		9,397		14,204		30,652	38	13,208	164
Greece			198	[2] 2	1,735					
Italy	34,498	6	19	1	36	(6)	105	2	224	1
Netherlands	40,141	392	23,464	5,809	21,162	5,604	22,643	5,016	20,985	6,472
Norway	11,284		4,695	3	5,552		5,102		6,239	
Sweden	5,220	[4] 20	1,354		1,555		1,545	184	3,490	432
Uruguay	[2] 3,938				133		146		[2] 382	
Total, 21 countries	283,595	364,284	99,977	138,412	96,597	128,588	119,087	131,187	120,682	139,955

Bureau of Agricultural Economics. Official sources except where otherwise noted.

[1] 1 year only.
[2] International Yearbook of Agricultural Statistics.
[3] 4-year average.
[4] 3-year average.
[5] Year beginning July 1.
[6] Less than 500 pounds.

TABLE 260.—*Cottonseed oil, crude: Average price per pound f. o. b. mills, 1909–1927*

Year beginning August	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Average
Average:	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1909–1913		5.55	5.45	5.52	5.55	5.60	5.59	5.67	6.07	6.23	6.21	6.01	
1914–1920	11.67	11.23	11.64	11.92	11.80	12.11	11.96	11.96	11.94	12.12	12.80	12.22	11.95
1921–1925		8.34	8.32	8.50	8.73	9.14	9.39	10.00	10.00	9.92			
1909	5.01	4.82	5.63	5.97	6.32	6.18	6.12	6.46	7.03	7.12	7.27	7.27	6.27
1910		7.00	6.44	6.17	6.20	6.14	5.80	5.55	5.20	5.43	5.47	4.88	
1911	4.27	4.80	4.38	4.40	4.15	4.36	4.52	4.60	5.48	6.22	5.80	5.30	4.86
1912	5.24	4.95	4.84	5.02	5.27	5.22	5.36	5.44	6.03	5.87	6.23	6.20	5.47
1913	6.10	6.18	5.94	6.06	5.83	6.10	6.16	6.30	6.60	6.53	6.26	6.40	6.20
1914	5.26	5.36	4.71	4.54	4.44	5.15	5.81	6.00	5.60	5.16	5.09	4.83	5.16
1915	4.40	5.41	6.67	6.64	7.31	7.71	7.67	8.72	9.18	9.61	9.54	9.20	7.67
1916	8.85	8.82	10.10	11.35	11.35	11.10	11.20	11.64	13.20	14.10	14.67	14.00	11.70
1917	13.92	13.86	15.93	17.40	17.33	17.50	17.50	17.50	17.50	17.50	17.50	17.50	16.74
1918	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50	17.50	21.56	21.75	18.19
1919	21.75	17.38	16.25	18.95	18.46	19.74	18.25	17.69	16.19	15.62	15.50	11.50	17.27
1920	10.00	10.25	10.35	7.08	6.19	6.10	5.80	4.70	4.43	5.34	5.74	6.76	6.90
1921	6.75	7.81	7.26	7.00	7.02	7.16	8.28	10.15	9.80	10.00	9.75	8.88	8.32
1922	8.50	6.46	7.34	8.30	8.52	9.84	9.02	10.45	10.25	9.88	9.75	9.00	9.02
1923		9.94	9.44	9.88	9.45	9.46	8.84	8.46	8.74	8.20	8.78	10.06	
1924	11.30	8.34	9.03	8.85	9.69	9.48	9.20	9.95	10.00	9.34	9.75		
1925		9.14	8.55	8.90	8.08	9.75	10.71	11.00	11.22	12.17			
1926	10.88	8.19	7.44	6.64	6.36	6.94	8.20	7.73	7.33	7.74	8.04	(1)	
1927	8.70	9.25	9.45	9.05	8.72								

Bureau of Agricultural Economics. Prices 1909–1912 and 1919–1927 are averages of weekly quotations in the Oil, Paint and Drug Reporter; 1913–1918 from War Industries Board Price Bulletin No. 15.

[1] Nominal.

TABLE 261.—*Cottonseed oil, prime summer yellow: Average spot price per pound (barrels), New York, 1920–1927*

Year beginning August	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
Average 1921–1925	10.78	10.28	10.00	10.13	10.19	10.56	10.57	11.27	11.38	11.62	11.87	11.93	10.89
1920	12.32	13.18	11.43	10.14	8.91	8.59	7.34	6.26	6.24	7.22	7.46	8.57	9.00
1921	8.69	9.88	8.69	8.30	8.28	8.62	9.96	11.48	11.57	11.71	11.33	10.97	9.96
1922	9.96	8.54	8.88	9.51	9.81	10.77	10.90	11.78	11.76	11.60	11.48	10.35	10.44
1923	10.34	11.62	12.01	11.67	11.00	11.00	10.03	9.77	10.09	9.82	10.42	11.98	10.81
1924	13.83	10.54	11.00	10.86	11.41	11.10	10.69	11.10	11.08	10.51	10.75	11.38	11.19
1925	11.09	10.81	9.86	10.32	10.47	11.33	11.28	12.24	12.38	14.48	15.38	14.99	12.05
1926	12.99	11.42	8.82	8.20	8.22	8.50	9.31	9.39	8.78	9.09	9.19	9.57	9.46
1927	9.89	10.74	10.83	10.55	10.06	------	------	------	------	------	------	------	------

Bureau of Agricultural Economics. 1920–21, from annual reports of the New York Produce Exchange; subsequently, compiled from Oil, Paint and Drug Reporter, average of daily ranges. Data for 1890–1919 are available in 1924 Yearbook, p. 766, Table 323.

TABLE 262.—*Cottonseed meal, 41 per cent protein: Price per ton, Memphis, 1920–1927*

Year beginning August	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Average
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1920	------	------	------	36.30	30.80	30.20	29.20	27.00	------	29.00	32.80	35.00	------
1921	------	38.20	35.70	35.00	36.30	37.10	39.30	45.10	47.60	49.25	47.50	44.75	------
1922	35.30	34.30	40.25	46.00	45.40	45.75	45.00	43.60	43.10	42.40	40.80	41.40	41.94
1923	43.20	42.90	44.90	47.40	45.00	43.62	41.00	39.60	39.50	39.50	40.25	43.62	42.54
1924	43.60	41.38	40.75	38.75	39.25	37.70	35.75	35.88	36.81	38.35	38.81	41.50	39.04
1925	44.10	36.88	34.35	34.12	34.00	32.62	31.12	31.00	31.94	30.67	31.00	31.10	33.58
1926	32.12	28.88	23.90	23.67	24.50	30.10	33.50	32.40	32.50	34.00	37.35	36.00	30.74
1927	------	37.40	37.70	39.60	41.40	------	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Compiled from reports made to the bureau.

TABLE 263.—*Cottonseed meal, 36 per cent protein, bagged: Average price per ton at eight markets, 1927*

Market	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Atlanta	26.10	------	------	------	30.80	32.10	33.10	33.00	36.00	36.80	37.10	37.75
Boston	35.50	37.55	35.85	36.55	38.80	40.75	39.90	40.70	43.65	45.15	45.25	45.90
Buffalo	33.50	35.30	34.10	33.80	36.75	39.45	38.50	38.85	40.75	40.35	42.10	43.80
Chicago	32.60	35.85	35.70	33.85	37.05	39.15	38.75	39.35	39.65	39.60	41.25	41.85
Cincinnati	33.55	34.35	33.60	32.10	35.55	37.95	37.55	36.10	38.75	38.80	41.05	41.80
Minneapolis	32.10	35.10	35.40	35.10	37.50	39.50	39.60	40.25	42.60	42.20	43.25	44.60
Philadelphia	35.55	37.80	35.75	36.55	38.95	40.50	40.00	40.00	42.60	42.90	44.40	45.80
Pittsburgh	33.35	36.75	36.20	34.95	------	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Compiled from reports made to the bureau.

TABLE 264.—*Hay, tame: Acreage, production, value, exports, etc., United States, 1849, 1859, 1866–1927*

Year	Acreage	Average yield per acre	Production	Price per ton received by producers, Dec. 1	Farm value, Dec. 1	Value per acre [1]	Domestic exports, year beginning July 1 [2]	Imports, year beginning July 1 [2]	Net balance, year beginning July 1 [2, 3]
	1,000 acres	*Short tons*	*1,000 short tons*	*Dollars*	*1,000 dollars*	*Dollars*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*
1849	------	------	*13,839*	------	------	------	------	------	------
1859	------	------	*19,084*	------	------	------	------	------	------
1866	17,669	1.23	21,779	10.14	220,836	12.50	6	------	------
1867	20,021	1.31	26,277	10.21	268,301	13.40	6	------	------

[1] Based on farm price Dec. 1.

[2] Compiled from 1866–1917 Commerce and Navigation of the United States, 1918 Foreign Commerce and Navigation of the United States; 1919–1927 Monthly Summary of Foreign Commerce of the United States, June issues.

[3] The difference between total exports (i. e., domestic exports plus reexports) and total imports; plus (+) indicates net exports and minus (−) indicates net imports.

TABLE 264.—*Hay, tame: Acreage, production, value, exports, etc., United States, 1849, 1859, 1866–1927*—Continued

Year	Acreage	Average yield per acre	Production	Price per ton received by producers, Dec. 1	Farm value, Dec. 1	Value per acre	Domestic exports, year beginning July 1	Imports, year beginning July 1	Net balance, year beginning July 1
	1,000 acres	*Short tons*	*1,000 short tons*	*Dollars*	*1,000 dollars*	*Dollars*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*
1868	21,542	1.21	26,142	10.08	263,589	12.24	...	[4]	...
1869	...	...	*27,316*	...	...	...	...	...	...
1869	18,591	1.42	26,420	10.18	268,933	14.47	8	[4]	...
1870	19,862	1.23	24,525	12.47	305,743	15.39	5	[4]	...
1871	19,009	1.17	22,239	14.30	317,940	16.73	6	[4]	...
1872	20,319	1.17	23,813	12.94	308,025	15.16	5	[4]	...
1873	21,894	1.15	25,085	12.53	314,241	14.35	5	[4]	...
1874	21,770	1.15	25,134	11.94	300,222	13.79	8	[4]	...
1875	23,508	1.19	27,874	10.78	300,378	12.78	8	[4]	...
1876	25,283	1.22	30,867	8.97	276,991	10.96	8	[4]	...
1877	25,368	1.25	31,629	8.37	264,880	10.44	11	21	−10
1878	26,931	1.47	39,608	7.20	285,016	10.58	9	12	−2
1879	*30,631*	*1.15*	*35,151*	...	...	...	...	...	...
1879	30,631	1.30	39,862	9.31	371,045	12.11	15	74	−59
1880	25,864	1.23	31,925	11.65	371,811	14.38	14	195	−181
1881	30,889	1.14	35,135	11.82	415,131	13.44	12	96	−85
1882	32,340	1.18	38,138	9.73	371,170	11.48	15	109	−94
1883	35,516	1.32	46,864	8.19	383,834	10.81	19	133	−114
1884	38,572	1.26	48,470	8.17	396,139	10.27	12	180	−168
1885	39,850	1.12	44,732	8.71	389,753	9.78	15	103	−88
1886	36,502	1.15	41,796	8.46	353,438	9.68	16	88	−72
1887	37,665	1.10	41,454	9.97	413,440	10.98	20	112	−92
1888	38,592	1.21	46,643	8.76	408,500	10.59	25	118	−93
1889	39,004	1.26	49,181	7.76	381,481	9.78	41	139	−99
1890	40,038	1.23	49,057	8.18	401,111	10.02	31	65	−34
1891	41,258	1.18	48,759	8.89	433,276	10.50	39	89	−50
1892	42,191	1.17	49,238	8.95	440,710	10.45	37	117	−80
1893	42,413	1.31	55,575	9.48	527,044	12.43	61	97	−36
1894	42,772	1.18	50,468	8.96	452,079	10.57	53	226	−173
1895	40,832	1.02	41,838	9.46	395,647	9.69	66	339	−273
1896	40,978	1.33	54,380	7.48	406,957	9.93	69	134	−65
1897	41,336	1.42	58,878	7.28	428,919	10.38	92	4	+87
1898	43,120	1.55	66,772	6.63	442,905	10.27	73	22	+50
1899	*43,127*	*1.25*	*53,828*	...	...	...	...	...	...
1899	43,127	1.33	57,450	8.20	470,844	10.92	81	161	−80
1900	42,070	1.27	53,231	9.72	517,399	12.30	100	160	−58
1901	42,066	1.33	55,819	9.91	553,328	13.15	172	54	+120
1902	42,962	1.52	65,296	9.19	599,781	13.96	57	328	−271
1903	43,400	1.57	68,154	9.35	637,485	14.69	68	128	−60
1904	44,645	1.55	69,192	8.91	616,369	13.81	75	52	+23
1905	45,991	1.59	72,973	8.59	627,023	13.63	79	77	+2
1906	47,891	1.39	66,341	10.43	692,116	14.45	66	68	−3
1907	49,098	1.47	72,261	11.78	850,915	17.33	87	11	+76
1908	51,196	1.53	78,440	9.14	716,644	14.00	75	8	+67
1909	*51,041*	*1.35*	*68,833*	...	...	...	...	...	...
1909	51,041	1.46	74,384	10.58	786,722	15.41	62	108	−47
1910	51,015	1.36	69,378	12.14	842,252	16.51	62	377	−315
1911	48,240	1.14	54,916	14.29	784,926	16.27	67	783	−716
1912	49,530	1.47	72,691	11.79	856,695	17.30	68	175	−107
1913	48,954	1.31	64,116	12.43	797,077	16.28	56	191	−135
1914	49,145	1.43	70,071	11.12	779,068	15.85	118	23	+96
1915	51,108	1.68	85,920	10.63	913,644	17.88	200	48	+151
1916	55,721	1.64	91,192	11.22	1,022,930	18.36	96	65	+31
1917	55,203	1.51	83,308	17.09	1,423,766	25.79	34	460	−426
1918	55,755	1.37	76,660	20.13	1,543,494	27.68	32	311	−278
1919	*55,658*	*1.34*	*74,724*	...	...	...	...	...	...
1919	56,888	1.53	86,997	20.05	1,744,547	30.67	67	252	−185
1920	58,101	1.55	89,785	17.66	1,585,355	27.29	55	126	−71
1921	58,769	1.40	82,458	12.10	998,069	16.98	61	5	+56
1922	61,159	1.57	95,748	12.55	1,202,063	19.65	53	35	+18
1923	59,868	1.49	89,250	14.13	1,261,486	21.07	24	403	−380
1924	*59,073*	...	...	...	...	...	...	...	...
1924	61,147	1.60	97,622	13.77	1,344,129	21.98	25	119	−94
1925	58,231	1.47	85,717	13.94	1,195,133	20.52	18	431	−413
1926	58,791	1.47	86,497	14.09	1,218,319	20.72	15	208	−194
1927 [5]	61,196	1.74	106,219	11.36	1,206,650	19.72	...	...	...

Bureau of Agricultural Economics. Italic figures are census returns; other acreage, production, and yield figures are estimates of the crop-reporting board.

[4] Reported in value only. [5] Preliminary.

TABLE 265.—*Hay, wild: Acreage, production, and December 1 price, United States, 1909–1927*

Year	Acreage	Yield per acre	Production	Price per ton received by producers Dec. 1	Year	Acreage	Yield per acre	Production	Price per ton received by producers Dec. 1
	1,000 acres	*Short tons*	*1,000 short tons*	*Dolls.*		*1,000 acres*	*Short tons*	*1,000 short tons*	*Dolls.*
1909	*17, 187*	1. 07	18, 383	--------	1919	17, 150	1. 07	18, 401	16. 50
1910	17, 187	. 77	13, 151	--------	1920	15, 787	1. 11	17, 460	11. 35
1911	17, 187	. 71	12, 155	--------	1921	15, 632	. 98	15, 391	6. 63
1912	17, 427	1. 04	18, 043	--------	1922	15, 871	1. 02	16, 131	7. 14
1913	16, 341	. 92	15, 063	--------	1923	15, 556	1. 12	17, 361	7. 88
1914	16, 752	1. 11	18, 615	7. 49	1924	15, 205	. 98	14, 859	7. 83
1915	16, 796	1. 27	21, 343	6. 80	1925	14, 560	. 87	12, 724	8. 53
1916	16, 635	1. 19	19, 800	7. 90	1926	12, 911	. 74	9, 568	10. 05
1917	16, 212	. 93	15, 131	13. 49	1927 [1]	14, 787	1. 17	17, 293	6. 58
1918	15, 365	. 94	14, 479	15. 23					

Bureau of Agricultural Economics. Figures in italics are census returns, others are estimates of the crop-reporting board.

[1] Preliminary.

TABLE 266.—*Hay, tame: Acreage and production, by States, average 1921–1925, annual 1925–1927*

State	Acreage				Production			
	Average, 1921–1925	1925	1926	1927 [1]	Average, 1921–1925	1925	1926	1927 [1]
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 tons*	*1,000 tons*	*1,000 tons*	*1,000 tons*
Maine	1, 253	1, 268	1, 272	1, 260	1, 419	1, 531	1, 428	1, 543
New Hampshire	456	469	469	463	524	572	534	588
Vermont	917	924	926	922	1, 265	1, 449	1, 461	1, 407
Massachusetts	446	471	475	466	585	626	594	674
Rhode Island	46	46	45	44	58	59	58	59
Connecticut	335	357	363	359	435	459	424	525
New York	4, 920	4, 917	4, 847	4, 850	6, 508	6, 794	6, 393	7, 311
New Jersey	287	257	250	257	420	400	391	461
Pennsylvania	3, 000	3, 038	2, 916	3, 075	4, 102	4, 225	3, 820	5, 063
Ohio	3, 240	3, 030	2, 938	3, 139	4, 335	3, 304	4, 033	5, 149
Indiana	2, 306	2, 005	1, 941	2, 057	2, 869	1, 982	2, 477	3, 040
Illinois	3, 343	3, 099	3, 078	3, 522	4, 386	3, 378	3, 621	5, 092
Michigan	2, 998	2, 887	2, 913	3, 039	3, 778	2, 871	4, 150	4, 748
Wisconsin	3, 217	3, 362	3, 368	3, 446	5, 118	5, 486	5, 742	6, 989
Minnesota	2, 088	2, 258	2, 267	2, 380	3, 295	3, 989	2, 977	4, 818
Iowa	3, 211	3, 034	3, 112	3, 203	4, 902	4, 142	3, 805	5, 357
Missouri	3, 380	3, 272	3, 147	3, 553	4, 080	3, 622	3, 531	5, 185
North Dakota	978	1, 066	1, 331	1, 040	1, 517	1, 821	1, 365	1, 943
South Dakota	1, 043	1, 095	1, 363	1, 105	1, 696	1, 452	1, 366	2, 269
Nebraska	1, 625	1, 672	1, 761	1, 727	3, 578	3, 635	3, 282	4, 145
Kansas	1, 619	1, 715	1, 565	1, 678	3, 335	3, 420	2, 707	4, 245
Delaware	76	75	76	80	104	106	112	142
Maryland	405	416	396	443	578	577	516	724
Virginia	1, 009	1, 020	979	1, 077	1, 086	779	992	1, 469
West Virginia	775	836	784	837	1, 003	1, 005	1, 036	1, 266
North Carolina	736	710	759	900	779	481	681	845
South Carolina	366	214	257	443	274	57	199	356
Georgia	692	506	522	803	459	169	400	565
Florida	107	78	82	95	89	54	57	64
Kentucky	1, 097	1, 009	1, 156	1, 318	1, 412	1, 155	1, 525	1, 871
Tennessee	1, 320	1, 162	1, 396	1, 352	1, 486	1, 069	1, 766	1, 762
Alabama	713	556	523	615	579	375	499	515
Mississippi	422	393	406	491	473	393	483	595
Arkansas	591	582	575	643	668	464	667	730
Louisiana	231	254	233	278	256	228	276	356
Oklahoma	767	480	572	566	1, 231	613	883	901
Texas	733	804	805	805	965	749	1, 115	1, 013
Montana	1, 136	1, 232	1, 309	1, 274	2, 030	2, 046	2, 063	2, 706
Idaho	1, 045	1, 032	1, 025	1, 014	2, 773	3, 385	2, 768	3, 151
Wyoming	689	663	682	685	1, 291	1, 283	1, 326	1, 271
Colorado	1, 219	1, 245	1, 258	1, 250	2, 530	2, 676	2, 905	2, 711
New Mexico	171	171	182	196	368	387	435	434
Arizona	159	160	176	192	544	555	641	672
Utah	524	568	562	567	1, 397	1, 874	1, 724	1, 474
Nevada	191	213	209	208	495	652	520	494
Washington	976	908	909	932	2, 080	2, 048	2, 001	2, 317
Oregon	964	925	912	898	1, 903	1, 903	1, 764	2, 048
California	2, 011	1, 777	1, 699	1, 649	5, 099	5, 417	4, 984	5, 156
United States	59, 835	58, 231	58, 791	61, 196	90, 159	85, 717	86, 497	106, 219

Bureau of Agricultural Economics. Estimates by the crop-reporting board.

[1] Preliminary.

TABLE 267.—*Hay, wild: Acreage and production, by States, average 1921–1925, annual 1925–1927*

State	Acreage				Production			
	Average, 1921–1925	1925	1926	1927 [1]	Average, 1921–1925	1925	1926	1927 [1]
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 tons*	*1,000 tons*	*1,000 tons*	*1,000 tons*
Maine	14	13	13	13	14	12	12	12
New Hampshire	11	17	17	17	13	14	15	17
Vermont	13	13	13	13	13	14	14	14
Massachusetts	12	13	13	13	12	13	12	13
Rhode Island	1	2	2	2	1	2	2	2
Connecticut	10	11	11	11	11	12	11	13
New York	67	68	68	68	77	76	76	78
New Jersey	20	16	16	17	26	26	25	26
Pennsylvania	22	20	20	15	27	25	25	22
Ohio	4	7	5	5	5	8	6	7
Indiana	22	21	21	21	24	19	24	28
Illinois	53	37	37	34	63	37	41	48
Michigan	50	45	38	42	58	44	44	56
Wisconsin	304	256	228	205	388	333	301	297
Minnesota	2,012	1,865	1,865	1,884	2,422	2,238	1,492	2,826
Iowa	381	311	300	255	439	305	252	324
Missouri	140	159	130	130	146	137	117	176
North Dakota	2,091	1,481	1,259	1,360	2,081	1,407	818	1,700
South Dakota	3,339	3,087	2,315	3,010	2,883	1,914	926	3,311
Nebraska	2,567	2,976	2,530	3,056	2,326	2,232	1,044	3,056
Kansas	928	938	902	947	991	788	640	1,231
Delaware	3	4	4	3	4	6	6	5
Maryland	4	4	4	3	5	4	5	4
Virginia	14	13	26	23	13	8	26	29
West Virginia	12	13	13	12	13	17	14	18
North Carolina	72	60	58	52	68	37	52	57
South Carolina	5	4	3	3	4	1	2	2
Georgia	17	12	18	22	13	6	14	17
Florida	5	4	4	4	4	3	4	3
Kentucky	24	23	23	32	25	24	29	45
Tennessee	48	35	56	50	50	23	62	60
Alabama	24	22	22	22	17	14	18	16
Mississippi	39	32	35	35	37	24	33	36
Arkansas	133	127	133	146	124	89	133	146
Louisiana	17	18	18	18	20	13	20	18
Oklahoma	491	424	549	565	461	280	439	554
Texas	207	211	231	219	196	95	277	219
Montana	659	650	393	865	581	585	314	995
Idaho	119	101	101	101	148	152	121	162
Wyoming	337	380	372	409	321	399	372	450
Colorado	373	360	360	396	375	360	360	396
New Mexico	38	35	30	30	31	28	33	30
Arizona	9	5	5	10	8	4	6	10
Utah	96	77	75	77	131	131	94	100
Nevada	169	177	160	160	204	230	160	144
Washington	28	30	30	30	38	46	42	52
Oregon	208	235	235	235	221	282	270	294
California	148	148	150	147	161	207	165	176
United States	15,365	14,560	12,911	14,787	15,293	12,724	9,568	17,293

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

[1] Preliminary.

TABLE 268.—*Hay, tame and wild: Yield per acre, by States, average 1914–1920, 1921–1925, annual 1922–1927*

State	Tame hay								Wild hay							
	Average, 1914–1920	Average, 1921–1925	1922	1923	1924	1925	1926	1927	Average, 1914–1920	Average, 1921–1925	1922	1923	1924	1925	1926	1927
	Short tons	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*
Maine	1.20	1.13	1.25	1.28	1.11	1.21	1.12	1.22	1.00	0.99	1.10	1.10	0.96	0.94	0.94	0.95
New Hampshire	1.20	1.15	1.23	1.22	1.11	1.22	1.14	1.27	.96	.91	1.00	.94	.95	.85	.90	1.00
Vermont	1.43	1.38	1.39	1.40	1.50	1.57	1.58	1.53	1.08	1.03	1.10	1.00	1.00	1.05	1.05	1.10
Massachusetts	1.40	1.31	1.32	1.37	1.28	1.33	1.25	1.45	1.06	1.00	1.00	1.00	1.00	1.00	.95	1.00
Rhode Island	1.27	1.28	1.29	1.24	1.28	1.28	1.29	1.34	.96	.89	.90	.95	.85	.85	1.00	1.00
Connecticut	1.36	1.30	1.35	1.32	1.26	1.29	1.17	1.46	1.05	1.08	1.00	1.20	1.07	1.05	1.00	1.20
New York	1.35	1.32	1.40	1.36	1.45	1.38	1.32	1.51	1.21	1.15	1.18	1.18	1.28	1.12	1.12	1.14
New Jersey	1.50	1.47	1.61	1.05	1.82	1.56	1.56	1.79	1.34	1.35	1.40	1.20	1.30	1.60	1.55	1.50
Pennsylvania	1.41	1.36	1.57	1.05	1.61	1.39	1.31	1.65	1.21	1.23	1.20	1.15	1.35	1.24	1.25	1.45
Ohio	1.38	1.33	1.50	1.20	1.59	1.09	1.37	1.64	1.34	1.27	1.50	1.15	1.14	1.14	1.22	1.45
Indiana	1.34	1.23	1.37	1.24	1.48	.99	1.28	1.48	1.21	1.05	1.14	1.15	1.00	.90	1.15	1.25
Illinois	1.29	1.30	1.45	1.30	1.49	1.09	1.18	1.45	1.23	1.19	1.25	1.15	1.35	1.00	1.10	1.40
Michigan	1.33	1.25	1.45	1.26	1.56	.99	1.42	1.56	1.22	1.16	1.30	1.20	1.25	.97	1.17	1.33
Wisconsin	1.68	1.58	1.70	1.33	1.87	1.63	1.70	2.03	1.39	1.28	1.30	1.30	1.30	1.30	1.32	1.45
Minnesota	1.74	1.55	1.58	1.25	1.61	1.77	1.31	2.02	1.37	1.20	1.22	1.15	1.17	1.20	.80	1.50
Iowa	1.48	1.52	1.47	1.52	1.78	1.37	1.22	1.67	1.25	1.15	1.14	1.20	1.26	.98	.84	1.27
Missouri	1.17	1.20	1.10	1.22	1.39	1.11	1.12	1.46	1.02	1.05	.95	1.10	1.22	.86	.90	1.35
North Dakota	1.27	1.55	1.57	1.49	1.60	1.71	1.03	1.87	.97	.99	1.05	1.00	.95	.95	.65	1.25
South Dakota	1.74	1.63	1.81	1.76	1.65	1.33	1.00	2.05	1.11	.85	.90	1.20	.75	.62	.40	1.10
Nebraska	1.88	2.20	1.95	2.41	2.29	2.17	1.86	2.40	1.02	.91	.85	1.10	1.00	.75	.65	1.00
Kansas	1.97	2.06	2.15	2.20	2.16	1.99	1.73	2.53	1.00	1.07	1.10	1.18	1.13	.84	.71	1.30
Delaware	1.28	1.37	1.51	1.17	1.53	1.41	1.47	1.78	1.26	1.27	1.24	1.36	1.40	1.50	1.50	1.60
Maryland	1.34	1.42	1.62	1.05	1.77	1.39	1.30	1.63	1.23	1.19	1.12	1.15	1.40	1.10	1.21	1.40
Virginia	1.20	1.07	1.26	1.00	1.36	.76	1.01	1.36	1.08	.93	1.00	1.00	1.25	.65	1.00	1.25
West Virginia	1.28	1.29	1.34	1.19	1.52	1.20	1.32	1.51	1.14	1.12	1.20	1.00	1.00	1.30	1.10	1.50
North Carolina	1.24	1.05	1.20	1.22	.98	.68	.90	.94	1.11	.92	1.00	1.00	1.00	.62	.90	1.10
South Carolina	1.11	.69	.99	.80	.56	.27	.77	.80	1.20	.72	1.00	.85	.60	.33	.65	.68
Georgia	1.08	.65	.84	.66	.51	.33	.77	.70	1.07	.79	.92	.90	.60	.51	.80	.78
Florida	1.07	.82	.71	.90	.78	.69	.70	.67	1.04	.84	.90	.85	.80	.75	.95	.75
Kentucky	1.24	1.28	1.38	1.36	1.42	1.14	1.32	1.42	1.16	1.06	1.15	1.00	1.20	1.05	1.25	1.40
Tennessee	1.29	1.12	1.33	1.15	1.04	.92	1.27	1.30	1.12	1.00	1.10	1.10	1.00	.65	1.10	1.20
Alabama	1.03	.79	.95	.80	.64	.67	.95	.84	1.12	.72	.80	.80	.50	.62	.84	.75
Mississippi	1.38	1.11	1.22	1.25	.94	1.00	1.19	1.21	1.22	.93	1.10	1.20	.60	.75	.95	1.02
Arkansas	1.28	1.13	1.25	1.26	1.07	.80	1.16	1.14	1.08	.94	1.00	1.21	.75	.70	1.00	1.00
Louisiana	1.58	1.14	1.33	1.44	.73	.90	1.18	1.28	1.34	1.12	1.40	1.20	1.00	.70	1.10	1.00
Oklahoma	1.62	1.57	1.67	1.71	1.58	1.28	1.54	1.59	.94	.93	.90	.98	1.10	.66	.80	.98
Texas	1.38	1.33	1.56	1.64	1.14	.93	1.39	1.26	1.06	.95	1.10	1.10	1.00	.45	1.20	1.00

Montana	1.71	1.79	1.89	1.88	1.74	1.66	1.58	2.12	.82	.88	.90	.91	.90	.90	.80	1.15
Idaho	2.69	2.66	2.52	2.50	2.17	3.28	2.70	3.11	1.22	1.23	1.20	1.20	.75	1.50	1.20	1.60
Wyoming	1.93	1.85	1.90	1.93	1.80	1.81	1.94	1.86	.99	.95	.95	1.05	.90	1.05	1.00	1.10
Colorado	2.22	2.08	1.91	2.05	2.11	2.15	2.31	2.17	1.02	1.00	.97	1.05	1.00	1.00	1.00	1.00
New Mexico	2.23	2.14	1.80	2.09	2.28	2.26	2.39	2.21	.81	.81	.80	.80	.80	.80	1.10	1.00
Arizona	3.36	3.42	3.29	3.56	3.69	3.47	3.64	3.50	.94	.80	.50	1.25	.50	.75	1.20	1.00
Utah	2.46	2.66	2.75	2.69	2.02	3.30	3.07	2.60	1.42	1.35	1.38	1.52	1.06	1.70	1.25	1.30
Nevada	2.68	2.60	2.82	2.67	1.75	3.06	2.49	2.38	1.09	1.19	1.59	1.09	.84	1.30	1.00	.90
Washington	2.19	2.13	1.98	2.35	1.85	2.26	2.20	2.49	1.28	1.35	1.14	1.58	1.00	1.55	1.40	1.75
Oregon	2.03	1.97	2.00	2.24	1.46	2.06	1.93	2.28	1.16	1.03	1.00	1.10	.75	1.20	1.15	1.25
California	1.90	2.55	2.47	2.55	2.35	3.05	2.93	3.13	1.07	1.07	1.10	1.00	.74	1.40	1.10	1.20
United States	1.52	1.51	1.57	1.49	1.60	1.47	1.47	1.74	1.09	.99	1.02	1.12	.98	.87	.74	1.17

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

TABLE 269.—*Hay, alfalfa: Acreage, yield per acre, and production, by States, 1923–1927*

State	Acreage					Yield per acre					Production				
	1923	1924	1925	1926	1927[1]	1923	1924	1925	1926	1927	1923	1924	1925	1926	1927[1]
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*1,000 tons*	*1,000 tons*	*1,000 tons*	*1,000 tons*	*1,000 tons*
Me	------	1	2	2	3	-----	2.80	3.00	3.00	2.60	------	3	6	6	8
N. H	------	1	1	2	3	-----	3.00	3.00	2.70	2.60	------	3	3	5	8
Vt	1	4	5	6	7	2.20	2.85	3.00	3.10	2.90	2	11	15	19	20
Mass	1	1	1	2	3	3.50	3.00	3.10	3.15	3.10	4	3	3	6	9
Conn	1	2	3	4	5	2.40	3.00	3.10	2.75	3.30	2	6	9	11	16
N. Y	163	200	210	218	225	2.40	2.60	2.58	2.20	2.53	391	520	542	480	569
N. J	19	23	24	25	25	2.19	2.75	2.70	2.70	2.75	42	63	65	68	69
Pa	36	77	73	85	83	2.35	2.30	2.40	2.43	2.50	85	177	175	207	208
Ohio	120	152	167	192	180	2.60	2.50	2.30	2.45	2.45	312	380	384	470	441
Ind	105	117	140	160	173	2.40	2.30	2.13	2.11	2.20	252	269	298	338	381
Ill	136	225	248	260	234	2.90	2.85	2.60	2.27	2.30	394	641	645	590	538
Mich	338	350	399	479	513	2.10	2.35	2.05	2.25	2.15	710	822	818	1,078	1,103
Wis	155	287	310	341	300	2.30	2.80	2.65	2.60	2.60	356	804	822	887	780
Minn	123	220	308	370	448	2.34	2.70	2.75	2.08	2.90	288	594	847	770	1,299
Iowa	230	288	245	272	340	3.00	3.05	2.41	2.45	2.80	690	878	590	666	952
Mo	185	189	181	190	166	2.35	2.50	2.45	2.32	2.50	435	472	443	441	415
N. Dak	80	116	151	143	172	2.10	2.00	2.25	1.50	2.40	168	232	340	214	413
S. Dak	590	711	725	667	740	2.10	1.80	1.43	1.22	2.25	1,239	1,280	1,037	814	1,665
Nebr	1,163	1,358	1,300	1,258	1,283	2.60	2.40	2.32	2.04	2.57	3,024	3,259	3,016	2,566	3,297
Kans	885	981	902	893	929	2.51	2.42	2.28	2.00	3.04	2,221	2,374	2,057	1,786	2,824
Del	2	4	4	5	5	2.50	2.50	2.70	2.60	2.70	5	10	11	13	14
Md	15	19	19	21	23	2.25	2.45	2.40	2.35	2.60	34	47	46	49	60
Va	35	36	40	46	47	2.10	2.20	1.53	2.00	2.30	74	79	61	92	108
W. Va	6	8	8	8	7	2.30	2.50	2.00	2.20	2.25	14	20	16	18	16
N. C	4	5	5	5	6	2.30	2.70	1.05	1.90	1.85	9	14	5	10	11
S. C	3	3	3	3	3	2.00	1.80	.55	1.50	.85	6	5	2	4	3
Ga	4	3	4	4	4	2.10	1.80	.48	1.40	1.45	8	5	2	6	6
Ky	58	54	51	54	65	2.20	2.20	2.25	2.50	2.20	123	119	115	135	143
Tenn	27	15	15	18	16	2.25	2.00	1.50	1.75	2.30	61	30	22	32	37
Ala	25	15	14	15	15	1.50	1.50	1.20	1.50	1.50	38	22	17	22	22
Miss	22	18	18	20	14	2.41	1.25	1.55	1.88	1.61	53	22	28	38	23
Ark	75	45	43	54	35	2.25	1.80	1.80	2.00	1.72	169	81	77	108	60
La	21	12	10	12	13	2.33	1.25	1.55	2.00	2.75	49	15	16	24	36
Okla	366	240	204	240	221	1.90	1.80	1.50	1.90	2.10	695	432	306	456	464
Tex	63	60	71	75	82	2.60	1.85	1.80	2.20	2.00	164	111	128	165	164
Mont	536	598	604	650	710	2.15	2.01	2.00	1.95	2.50	1,152	1,202	1,208	1,268	1,775
Idaho	657	731	709	674	654	3.00	2.50	3.80	3.20	3.70	1,971	1,828	2,694	2,157	2,420
Wyo	500	400	400	408	388	2.10	2.00	2.20	2.20	2.15	1,050	800	880	898	834
Colo	783	873	870	879	853	2.25	2.30	2.30	2.60	2.40	1,762	2,008	2,001	2,285	2,047
N. Mex	104	116	116	121	117	2.60	2.70	2.70	2.75	2.75	270	313	313	333	322
Ariz	135	125	128	134	140	4.00	4.30	4.00	4.30	4.20	540	538	512	576	588
Utah	458	467	495	495	500	2.81	2.14	3.50	3.25	2.70	1,287	999	1,732	1,609	1,350
Nev	124	141	148	145	146	3.23	2.06	3.60	3.00	2.80	401	290	533	435	409
Wash	235	260	273	245	260	3.60	3.00	3.00	3.30	3.30	846	780	819	808	858
Oreg	246	244	234	222	220	3.50	2.50	3.00	3.10	3.60	861	610	702	688	792
Calif	981	964	971	981	1,001	3.80	3.75	4.20	4.00	4.20	3,728	3,615	4,078	3,924	4,204
U. S	9,816	10,759	10,852	11,103	11,377	2.65	2.49	2.62	2.48	2.79	25,990	26,786	28,439	27,575	31,781

Bureau of Agricultural Economics. Estimates by the crop-reporting board.

[1] Preliminary

TABLE 270.—*Hay, clover: Acreage, yield per acre, and production, by States, 1923–1927*

State	Acreage					Yield per acre					Production				
	1923	1924	1925	1926	1927 [1]	1923	1924	1925	1926	1927	1923	1924	1925	1926	1927 [1]
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*1,000 tons*	*1,000 tons*	*1,000 tons*	*1,000 tons*	*1,000 tons*
Me.	38	34	34	35	37	1.70	1.50	1.70	1.70	1.80	65	51	58	60	67
N. H.	14	9	9	9	10	1.70	1.60	1.80	1.70	2.00	24	14	16	15	20
Vt.	26	25	25	25	26	1.78	1.70	1.90	2.00	2.05	46	42	48	50	53
Mass.	14	17	17	17	18	1.80	1.96	2.00	1.90	2.05	25	33	34	32	37
R. I.	1	1	1	1	1	1.70	1.60	1.90	2.00	2.20	2	2	2	2	2
Conn.	14	15	15	15	17	1.90	2.00	2.05	1.90	2.25	27	30	31	28	38
N. Y.	481	454	459	454	468	1.60	1.65	1.62	1.45	1.82	770	749	744	658	852
N. J.	33	14	13	12	14	1.00	1.86	1.60	1.58	1.80	33	26	21	19	25
Pa.	294	315	325	254	262	1.05	1.62	1.58	1.23	1.62	309	510	514	312	424
Ohio	780	620	583	406	501	1.10	1.56	1.14	1.29	1.67	858	967	665	524	838
Ind.	426	711	614	312	503	1.10	1.43	.94	1.05	1.53	469	1,017	577	328	768
Ill.	773	740	658	515	734	1.20	1.60	1.10	1.10	1.57	928	1,184	724	567	1,153
Mich.	808	700	630	506	602	1.18	1.45	.95	1.33	1.56	953	1,015	598	671	939
Wis.	668	824	783	775	930	1.42	2.10	1.75	1.90	2.20	949	1,730	1,370	1,472	2,046
Minn.	366	535	580	527	567	1.26	1.74	1.90	1.43	2.10	461	931	1,102	754	1,189
Iowa	801	700	630	658	662	1.44	1.80	1.35	1.32	1.68	1,153	1,260	850	867	1,115
Mo.	598	776	698	525	706	1.30	1.45	1.20	1.21	1.55	777	1,125	838	635	1,094
N. Dak.	116	182	223	189	246	1.85	1.75	2.00	1.30	2.20	215	318	446	246	540
S. Dak.	57	117	130	76	88	1.50	1.60	1.25	.99	1.98	86	187	162	75	174
Nebr.	100	144	116	104	137	1.70	2.00	1.65	1.55	1.93	170	288	191	255	264
Kans.	119	139	228	254	272	1.60	1.75	1.70	1.56	1.96	190	243	387	396	533
Del.	18	15	15	14	17	1.02	1.35	1.40	1.50	1.70	18	20	21	21	29
Md.	96	85	84	76	84	.90	1.70	1.31	1.09	1.60	86	144	110	83	134
Va.	168	160	160	93	130	.80	1.47	.82	.90	1.60	134	235	131	84	208
W. Va.	74	50	51	46	46	1.30	1.60	1.40	1.65	1.60	96	80	71	76	74
N. C.	105	104	114	91	100	1.40	1.00	.70	1.00	1.00	147	104	80	91	100
S. C.	2	3	2	4	4	1.50	.85	.25	.80	.76	3	3	1	3	3
Ga.	3	5	5	4	5	1.20	.90	.42	.92	.95	4	4	2	4	5
Fla.	......	1	1	......	......	......	.60	.60	......	......	......	1	1	......	......
Ky.	184	164	137	123	179	1.40	1.45	1.20	1.40	1.57	258	238	165	172	281
Tenn.	298	275	234	245	294	1.20	1.00	.90	1.30	1.44	358	275	211	318	423
Ala.	46	24	22	25	30	.83	.79	.73	1.10	1.00	38	19	16	28	30
Miss.	92	97	98	103	113	1.25	.91	.95	1.18	1.16	115	88	93	122	131
Ark.	60	95	90	88	97	1.41	1.00	.75	.94	1.25	85	95	68	83	121
La.	34	43	40	42	29	1.80	.65	.70	1.00	1.30	61	28	28	42	38
Okla.	6	21	10	21	25	1.65	1.30	1.00	1.40	1.32	10	27	10	29	33
Mont.	55	51	55	50	56	1.80	1.85	1.70	1.90	1.95	99	94	94	95	109
Idaho	32	45	42	55	62	2.00	1.80	2.60	2.40	2.60	64	81	109	132	161
Wyo.	27	15	18	25	27	1.50	1.60	1.90	1.60	1.55	40	24	34	40	42
Colo.	23	20	20	22	26	1.80	1.80	1.90	2.20	2.00	41	36	38	48	52
N. Mex.	2	2	2	2	2	2.00	2.00	1.70	2.00	1.70	4	4	3	4	3
Utah	2	3	3	3	3	2.08	1.50	2.50	2.40	2.35	4	4	8	7	7
Nev.	1	2	2	2	2	1.73	1.70	2.50	2.00	1.80	2	3	5	4	4
Wash.	74	74	70	28	27	2.55	2.00	2.40	2.50	2.70	189	148	168	70	73
Oregon	147	112	96	99	110	2.70	1.70	2.10	2.04	2.30	307	190	202	202	253
Calif.	15	8	8	8	8	1.70	1.50	1.65	1.60	1.50	26	12	13	13	12
U. S.	8,091	8,546	8,150	6,998	8,277	1.33	1.60	1.36	1.39	1.75	10,789	13,679	11,060	9,737	14,497

Bureau of Agricultural Economics. Estimated by the crop-reporting board.

[1] Preliminary.

TABLE 271.—*Hay, clover and timothy (mixed): Acreage, yield per acre, and production, by States, 1923–1927*

State	Acreage					Yield per acre					Production				
	1923	192	1925	1926	1927 [1]	1923	1924	1925	1926	1927	1923	1924	1925	1926	1927 [1]
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*1,000 tons*	*1,000 tons*	*1,000 tons*	*1,000 tons*	*1,000 tons*
Me	610	550	546	547	546	1. 40	1. 29	1. 40	1. 30	1. 45	854	710	764	711	792
N. H	174	157	157	157	154	1. 38	1. 40	1. 50	1. 40	1. 55	240	220	236	220	239
Vt	550	540	535	535	530	1. 50	1. 61	1. 65	1. 70	1. 65	825	869	883	910	874
Mass	146	128	127	128	124	1. 58	1. 61	1. 65	1. 52	1. 70	231	206	210	195	211
R. I	16	14	14	14	13	1. 40	1. 59	1. 60	1. 65	1. 80	22	21	22	23	23
Conn	83	65	64	65	63	1. 50	1. 60	1. 65	1. 45	1. 90	124	104	106	94	120
N. Y	2, 256	2, 273	2, 227	2, 205	2, 180	1. 40	1. 52	1. 40	1. 36	1. 62	3, 158	3, 455	3, 11[illegible]	[illegible], 929	
N. J	142	129	130	125	133	1. 04	1. 78	1. 50	1. 45	1. 80	148	230	195	181	239
Pa	1, 560	1, 594	1, 563	1, 406	1, 496	1. 04	1. 65	1. 39	1. 30	1. 67	1, 622	2, 630	2, 173	1, 823	2, 498
Ohio	920	1, 244	1, 139	1, 025	1, 230	1. 15	1. 60	1. 05	1. 28	1. 65	1, 058	1, 990	1, 196	1, 312	2, 030
Ind	528	669	670	460	594	1. 16	1. 60	. 86	1. 26	1. 50	612	1, 070	576	580	891
Ill	722	799	687	721	865	1. 21	1. 58	1. 00	1. 20	1. 60	874	1, 262	687	865	1, 384
Mich	1, 123	1, 518	1, 410	1, 368	1, 436	1. 15	1. 50	. 80	1. 25	1. 43	1. 291	2 277	1 128	1, 710	2, 053
Wis	1, 625	1, 648	1, 727	1, 710	1, 744	1. 30	1. 80	1. 50	1. 55	1. 9.	2, 112	2, 966	2, 590		3. 401
Minn	701	842	867	790	822	1. 23	1. 59	1. 58	1. 00	1. 80	862	1, 339	1, 3		1, 480
Iowa	1, 240	1, 792	1, 493	1, 433	1, 433	1. 50	1. 67	1. 27	1. 00	1. 45	1, 860	2, 993	1, 898	1, 433	2, 078
Mo	1, 002	1, 098	1, 021	939	1, 075	1. 22	1. 35	1. 00	1. 00	1. 40	1, 222	1, 482	1, 02	939	1, 505
N. Dak	16	34	32	27	29	1. 40	1. 60	1. 75	. 96	. 90		54	56	26	55
S. Dak	92	80	60	42	46	1. 30	1. 45	1. 15	. 62	1. 55	120	116	69	26	71
Nebr	84	43	50	56	60	1. 70	1. 80	1. 34	1. 13	1. 6	143	77	67	63	100
Kans	87	106	98	88	58	1. 57	1. 52	1. 40	1. 23	1. 83	13	161	137	108	106
Del	24	32	31	31	31	1. 00	1. 50	1. 30	1. 25	1. 60	24	48	40	39	50
Md	135	194	194	175		1. 00	1. 78	1. 24	1. 08	1. 50	135	345	241	189	300
Va	324	300	285	239	292	. 85	1. 60	. 75	. 95	1. 40	275	480	214	227	409
W. Va	292	330	343	302	349	1. 20	1. 62	1. 20	1. 35	1. 60	350	535	412	408	558
N. C.	39		19	39	43	1. 30	1. 40	70	1. 00	1. 15	51	63			49
Ga.	2		2	2	2	1. 00	1. 00	. 42	. 92	. 95					2
Ky	200	217	182	164	197	1. 30	1. 45	1. 20	1. 33	1. 50	260	315	218	218	296
Tenn.	200	250	212	180	216	1. 30	1. 00	. 85	1. 40	1. 40	260	250	180		302
Ala	3	3	3			1. 10	1. 00	1. 00			3	3			
Miss.			2	6	6	1. 47	1. 00	1. 10	1. 15			2			
Ark	55	80	76	70	77	1. 10	1. 00	. 75	1. 20	1. 25	60	80		84	
La						. 25									
Okla	6	10	7	11	11	1. 10	1. 39	1. 10	1. 35	1. 30		14	8	15	14
Mont	165	157	157	140	154	2. 00	1. 61	1. 70	1. 48	1. 95	330	253	267	207	300
Idaho	95	97	93	102	104	1. 90	1. 60	2. 50	2. [illegible]	2. 25	180	155	232	204	234
Wyo	37	74	73	71	78	1. 50	1. 61	2. 00	2. 00	1. 65	56	119	146	142	129
Colo	122	126	126	121	109	1. 70	1. 90	2. 00	1. 90	2. 00	207		252	230	218
N. Mex	2	4	4	4	4	1. 50	1. 70	1. 40	2. 00	1. 70	3	.	6	8	7
Utah	25	20	21	19	19	2. 08	1. 25	2. 30	2. 10	2. 30	52	25		40	44
Nev	12	13	13	13	11	1. 47	1. 20	2. 00	1. 50	1. 90	18	16			21
Wash	96	106	100	141	150	2. 55	1. 90	2. 25	2. 50	2. 55	245	201			382
Oreg	30	67	70	71	64	2. 30	1. 70	1. 70	2. 00	2. 20	69	114			141
Calif	52	20	20	20	20	1. 70	1. 30	1. 70	1. 60	1. 50	83	26			30
U. S	15, 596	17, 472	16, 689	15, 762	16, 774	1. 30	1. 58	1. 27	1. 30	1. 63	20, 216	27, 524	21, 267	20, 520	27, 280

Bureau of Agricultural Economics. Estimated by the crop-reporting board.

Preliminary.

TABLE 272.—*Hay, timothy: Acreage, yield per acre, and production, by States, 1923–1927*

State	Acreage					Yield per acre					Production				
	1923	1924	1925	1926	1927[1]	1923	1924	1925	1926	1927	1923	1924	1925	1926	1927[1]
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*1,000 tons*	*1,000 tons*	*1,000 tons*	*1,000 tons*	*1,000 tons*
Me.	144	139	137	138	136	1.32	1.21	1.30	1.19	1.30	190	168	178	164	177
N. H.	62	45	45	45	44	1.30	1.30	1.45	1.30	1.40	81	58	65	58	62
Vt.	104	138	137	137	136	1.40	1.36	1.50	1.55	1.50	146	188	206	212	204
Mass.	71	57	57	57	56	1.50	1.47	1.55	1.46	1.60	107	84	88	83	90
R. I.	8	4	4	4	4	1.30	1.56	1.45	1.45	1.70	10	6	6	6	7
Conn.	43	35	35	38	38	1.40	1.55	1.57	1.40	1.70	60	54	55	53	61
N. Y.	1,313	1,282	1,244	1,207	1,147	1.32	1.40	1.27	1.24	1.41	1,733	1,795	1,580	1,497	1,617
N. J.	77	68	60	59	55	.85	1.63	1.35	1.35	1.60	65	111	81	80	88
Pa.	935	971	932	1,032	1,085	1.00	1.55	1.28	1.26	1.60	935	1,505	1,193	1,300	1,736
Ohio	1,310	1,200	1,036	1,191	1,072	1.15	1.50	.88	1.30	1.48	1,506	1,800	912	1,548	1,587
Ind.	744	607	370	750	521	1.20	1.38	.73	1.24	1.25	893	838	270	930	651
Ill.	1,004	896	771	786	731	1.15	1.30	.78	1.05	1.30	1,155	1,165	601	825	950
Mich.	686	390	359	449	382	1.10	1.30	.67	1.15	1.33	755	507	241	510	508
Wis.	572	439	430	426	350	1.05	1.57	1.30	1.30	1.67	601	689	559	554	584
Minn.	573	353	335	305	308	1.02	1.36	1.35	.90	1.60	584	480	452	274	493
Iowa	760	471	524	569	523	1.17	1.38	1.03	.88	1.30	889	650	540	501	680
Mo.	1,142	1,106	1,029	1,064	1,117	.95	1.15	.83	.89	1.30	1,085	1,272	854	947	1,452
N. Dak.	139	76	72	61	66	1.20	1.15	1.25	.75	1.50	167	87	90	46	99
S. Dak.	129	72	54	55	58	1.15	1.18	.90	.52	1.35	148	85	49	29	78
Nebr.	20	14	15	16	25	1.40	1.40	1.14	1.00	1.43	28	20	17	16	36
Kans.	75	69	72	71	95	1.38	1.26	1.26	1.05	1.50	104	87	91	75	142
Del.	10	11	11	11	9	.85	1.40	1.15	1.26	1.50	8	15	13	14	14
Md.	81	70	66	63	68	.90	1.63	1.23	1.12	1.56	73	114	81	71	106
Va.	105	126	117	167	150	.75	1.45	.75	.85	1.28	79	183	88	142	192
W. Va.	229	220	224	214	224	1.10	1.45	1.12	1.20	1.45	252	319	251	257	325
N. C.	23	25	26	21	23	1.30	1.20	.64	.90	.90	30	30	17	19	21
S. C.	-----	2	2	4	4	-----	.85	.25	.80	.76	-----	2	1	3	3
Ga.	2	4	4	2	2	1.00	1.00	.42	.92	.95	2	4	2	2	2
Ky.	219	239	201	181	172	1.30	1.25	1.00	1.25	1.40	285	299	201	226	241
Tenn.	100	80	68	75	90	1.05	.95	.82	1.35	1.35	105	76	57	101	122
Ala.	2	4	2	-----	-----	1.20	1.00	1.00	-----	-----	2	4	2	-----	-----
Miss.	-----	4	4	-----	-----	-----	.90	1.00	-----	-----	-----	4	4	-----	-----
Ark.	20	30	29	26	28	1.00	1.00	.75	1.10	1.25	20	30	22	29	35
Okla.	4	13	8	13	14	1.20	1.44	1.25	1.50	1.30	5	19	10	20	18
Mont.	87	100	100	101	101	1.63	1.40	1.40	1.05	1.60	142	140	140	106	162
Idaho	106	57	54	58	60	1.70	1.20	1.90	1.40	1.80	180	68	103	81	108
Wyo.	52	29	30	28	28	1.40	1.30	1.60	1.60	1.45	73	38	48	45	41
Colo.	44	30	30	32	38	1.60	1.80	1.80	1.80	1.80	70	54	54	58	68
N. Mex.	2	5	5	5	5	1.30	1.70	1.40	1.90	1.50	3	8	7	10	8
Utah	13	8	8	7	7	2.11	1.25	2.15	2.00	2.25	27	10	17	14	16
Nev.	7	8	8	8	8	1.59	1.10	2.00	1.50	1.90	11	9	16	12	15
Wash.	52	51	51	64	72	2.10	1.50	2.00	1.80	2.20	109	76	102	115	158
Oreg.	20	18	17	17	16	1.80	1.50	2.00	1.62	2.00	36	27	34	28	32
Calif.	15	4	4	4	4	1.50	1.20	1.60	1.60	1.50	22	5	6	6	6
U. S.	11,104	9,570	8,787	9,561	9,070	1.15	1.38	1.07	1.16	1.43	12,776	13,183	9,404	11,073	12,995

Bureau of Agricultural Economics. Estimated by the crop-reporting board.

[1] Preliminary.

TABLE 273.—*Hay, grains cut green: Acreage, yield per acre, and production, by States, 1923–1927*

State	Acreage					Yield per acre					Production				
	1923	1924	1925	1926	1927 [1]	1923	1924	1925	1926	1927	1923	1924	1925	1926	1927 [1]
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*1,000 tons*	*1,000 tons*	*1,000 tons*	*1,000 tons*	*1,000 tons*
Me.	16	4	4	4	4	2.20	1.70	1.85	1.85	1.90	35	7	7	7	8
N. H.	10	6	6	6	7	2.20	2.00	2.25	1.90	2.00	22	12	14	11	14
Vt.	16	19	19	19	19	2.00	2.20	2.25	2.20	2.20	32	42	43	42	42
Mass.	14	8	8	9	11	2.00	2.00	2.15	1.80	2.00	28	16	17	16	22
R. I.	3	1	1	1	1	1.60	1.75	1.85	1.90	2.10	5	2	2	2	2
Conn.	12	6	6	7	7	2.00	2.05	2.00	1.90	1.90	24	12	12	13	13
N. Y.	86	28	29	30	30	1.40	1.87	2.00	1.69	1.93	120	52	58	51	58
N. J.	7	3	3	3	3	1.08	2.10	1.75	1.70	1.82	8	6	5	5	5
Pa.	18	10	9	12	8	1.50	1.80	1.80	1.85	1.75	27	18	16	22	14
Ohio	40	25	18	19	19	1.40	1.70	1.30	1.40	1.58	56	42	23	27	30
Ind.	147	27	35	38	48	1.20	1.50	1.11	1.00	1.10	176	40	39	38	53
Ill.	62	20	26	39	35	1.53	1.44	1.09	1.00	1.32	95	29	28	39	46
Mich.	27	20	22	31	28	1.25	1.40	1.15	1.45	1.60	34	28	25	45	45
Wis.	45	26	21	24	24	1.30	1.61	1.60	1.00	1.65	58	42	34	38	40
Minn.	80	46	39	121	72	1.30	1.65	1.70	1.30	1.75	104	76	66	157	126
Iowa	31	17	47	56	70	1.60	1.60	1.40	1.25	1.60	50	27	66	70	112
Mo.	45	49	64	86	95	1.10	1.40	1.28	1.05	1.20	50	69	82	90	114
N. Dak.	256	210	315	693	222	1.25	1.40	1.65	.90	1.50	320	294	520	624	333
S. Dak.	80	46	55	456	46	1.20	1.10	.90		1.70	96	51	50	342	78
Nebr.	34	32	34	102	37	1.25	1.70	1.40	1.31	1.58	42	54	48	134	58
Kans.	30	42	84	67	90	1.20	1.60	1.50	1.15	1.42	36	67	126	77	128
Del.	2	2	2	3	3	1.75	1.60	1.90	1.60	1.55	4	3	4	5	5
Md.	8	5	6	5	5	1.50	2.00	1.57	1.50	1.70	12	10	9	8	8
Va.	41	26	26	23	20	1.00			1.00	1.30	41	39	30	23	26
W. Va.	39	15	18	14	15	1.40	1.70	1.50	1.65	1.65	55	26	27	23	25
N. C.	80	79	89	93	112	1.30	1.06	.75	.83	.95	104	84	67	77	106
S. C.	35	20	21	25	30	1.20	.55				42	11	10	22	22
Ga.	70	30	45	38	44	.61	.55	.40	.82	.80	43	16	18	31	35
Fla.	6	1	1	------	------	.95	.95	.90			6	1	1	------	------
Ky.	130	30	35	37	35	1.10	1.53	1.20	1.20	1.45	143	46	42	44	51
Tenn.	95	50	60	84	50	.80	.80	1.00	1.20	1.30	76	40	60	101	65
Ala.	118	25	30	33	30	.75	.65	.60	.78		88	16	18	26	23
Miss.	10	10	12	9	13	1.02	.80	.88	1.10		10	8	11	10	13
Ark.	75	50	45	49	44	.80	1.10	.68	.75	.82	60	55	31	37	36
La.	6	------	------	------	------	1.50	------				9	------	------	------	------
Okla.	53	33	38	40	35	1.10	1.00	.78	1.00	.85	58	33	30	40	30
Tex.	50	45	65	79	71	1.90	1.10	.45	1.20	.85	95	50	29	95	60
Mont.	208	190	211	274	140	1.37	1.40	1.10	1.00	1.40	285	266	232	274	196
Idaho	149	109	98	102	100	1.50	1.40	1.90	1.50	1.70	224	153	186	153	170
Wyo.	75	53	62	70	80	1.70	1.50	1.40	1.50	1.50	128	80	87	105	120
Colo.	107	88	90	94	103	1.20	1.00	1.40	1.50	1.40	128	88	126	141	144
N. Mex.	11	20	17	20	25	1.20	1.30	1.20	1.75	1.20	13	26	20	35	30
Ariz.	18	23	20	20	30	1.50	1.50	1.50	1.70	1.70	27	34	30	34	51
Utah	11	6	6	6	6	1.69	1.00	1.90	1.50	1.50	19	6	11	9	9
Nev.	6	1	1	1	1	1.28	.90	1.50	1.20	1.30	8	1	2	1	1
Wash.	490	420	357	371	360	1.75	1.25	1.80	1.50	2.00	858	525	643	556	720
Oreg.	413	410	415	410	390	1.50	.80	1.70		1.70	620	328	706	574	663
Calif.	930	892	694	616	546	1.40	.90	1.60	1.40	1.40	1,302	803	1,110	862	764
U. S.	4,295	3,278	3,309	4,339	3,164	1.37	1.14	1.46	1.18	1.49	5,876	3,734	4,821	5,136	4,714

Bureau of Agricultural Economics. Estimated by the crop-reporting board.

[1] Preliminary.

TABLE 274.—*Hay, annual legumes: Acreage, yield per acre, and production, by States, 1923–1927*

State	Acreage					Yield per acre					Production				
	1923	1924	1925	1926	1927[1]	1923	1924	1925	1926	1927	1923	1924	1925	1926	1927[1]
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*1,000 tons*	*1,000 tons*	*1,000 tons*	*1,000 tons*	*1,000 tons*
Me.	2					1.20					2				
N. H.	2					1.30					3				
Vt.	1					1.30					1				
Mass.	1					1.50					2				
R. I.	1					1.40					1				
Conn.	1					1.40					1				
N. Y.	5	4	4	4	3	1.20	1.60	2.00	2.12	2.00	6	6	8	8	6
N. J.	3	2	2	2	2	1.30	2.12	1.60	2.15	2.00	4	4	3	4	4
Pa.	4	7	6	9	9	1.50	1.75	1.80	1.65	2.00	6	12	11	15	18
Ohio	50	46	44	60	90	1.50	1.55	1.70	1.70	1.80	75	71	75	102	162
Ind.	74	165	123	165	169	1.45	1.19	1.39	1.19	1.41	107	196	171	196	239
Ill.	239	357	252	300	375	1.70	1.26	1.30	1.28	1.33	406	449	327	383	500
Mich.	36	12	13	10	10	1.50	1.58	1.62	1.45	1.25	54	19	21	14	12
Wis.	35	17	15	14	12	1.30	1.64	1.80	1.68	1.70	45	28	27	24	20
Minn.	45			4	4	1.10			1.80	1.90	50			7	8
Iowa	12	20	20	24	35	1.90	2.00	2.00	2.00	2.00	23	40	40	48	70
Mo.	165	151	120	168	210	1.22	1.30	1.54	1.60	1.65	202	196	185	269	347
N. Dak.	25					1.40					35				
S. Dak.	12					1.00					12				
Nebr.	5	4	6	7	5	1.50	1.30	1.40	1.40	1.60	8	5	8	10	8
Kans.	8	8	6	7	6	1.31	1.35	1.50	1.57	1.67	10	11	9	11	10
Del.	20	10	10	10	13	1.40	1.70	1.40	1.70	2.08	28	17	14	17	27
Md.	32	46	43	51	53	1.50	1.83	2.00	2.16	1.90	48	84	86	110	101
Va.	243	275	280	288	346	1.24	.85	.65	1.09	1.20	302	233	182	313	414
W. Va.	13	34	31	52	41	1.54	1.76	1.91	1.90	1.80	20	60	59	99	74
N. C.	386	343	318	390	494	1.02	.82	.64	.83	.88	394	280	202	325	436
S. C.	339	258	148	164	334	.71	.51	.22	.74	.80	242	131	33	121	267
Ga.	562	619	378	370	624	.64	.47	.32	.65	.65	359	292	121	239	408
Fla.	59	61	51	52	62	.90	.80	.65	.67	.69	53	49	33	35	43
Ky.	96	99	80	113	138	1.45	1.61	1.45	1.71	1.60	139	159	116	193	221
Tenn.	311	277	233	316	328	1.19	1.17	1.04	1.23	1.28	371	325	243	388	419
Ala.	404	390	335	291	380	.66	.51	.57	.79	.74	266	199	191	230	283
Miss.	202	113	136	131	199	1.10	.92	.97	1.08	1.21	222	104	132	142	240
Ark.	137	115	127	116	147	1.08	.85	.74	1.00	.99	148	98	94	116	146
La.	111	149	144	113	167	1.14	.71	.90	1.04	1.23	127	106	129	118	206
Okla.	33	28	33	31	55	1.30	1.00	.85	1.00	1.00	43	28	28	31	55
Texas	56	100	95	108	138	.84	.65	.47	.94	.90	47	65	45	101	124
Mont.	5					1.35					7				
Colo.	14					1.40					20				
N. Mex.	3					1.50					4				
Wash.	7					2.25					16				
Oreg.	49					2.00					98				
Calif.	20					1.50					30				
U. S.	3,828	3,710	3,053	3,370	4,449	1.05	.88	.85	1.09	1.09	4,037	3,267	2,593	3,669	4,868

Bureau of Agricultural Economics. Estimated by the crop-reporting board.

[1] Preliminary.

TABLE 275.—*Hay, millet, Sudan grass, and other: Acreage, yield per acre, and production, by States, 1923–1927*

State	Acreage					Yield per acre					Production				
	1923	1924	1925	1926	1927 [1]	1923	1924	1925	1926	1927	1923	1924	1925	1926	1927 [1]
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*1,000 tons*	*1,000 tons*	*1,000 tons*	*1,000 tons*	*1,000 tons*
Me.	435	547	545	546	534	1.03	0.88	0.95	0.88	0.92	448	481	518	480	491
N. H.	179	252	251	250	245	.94	.85	.95	.90	1.00	168	214	238	225	245
Vt.	220	209	203	204	204	1.06	1.21	1.25	1.12	1.05	233	253	254	228	214
Mass.	187	263	261	262	254	1.06	1.00	1.05	1.00	1.20	198	263	274	262	305
R. I.	16	27	26	25	25	1.00	1.06	1.02	1.00	1.00	16	29	27	25	25
Conn.	166	236	234	234	231	1.10	1.05	1.05	.96	1.20	183	248	246	225	277
N. Y.	615	759	744	729	797	.83	.91	1.00	.96	.85	510	691	744	700	677
N. J.	31	26	25	24	25	.90	1.61	1.20	1.40	1.25	28	42	30	34	31
Pa.	72	126	130	118	132	1.14	1.15	1.10	1.15	1.25	82	145	143	136	165
Ohio	30	44	43	45	47	1.60	1.20	1.15	1.10	1.30	48	53	49	50	61
Ind.	70	76	53	56	49	1.25	1.00	.97	1.20	1.16	88	76	51	67	57
Ill.	344	481	457	457	548	1.20	1.10	.80	.77	.95	413	529	366	352	521
Mich.	87	60	54	70	68	1.40	1.50	.75	1.65	1.30	122	90	40	116	88
Wis.	87	76	76	78	86	1.40	1.63	1.10	1.50	1.37	122	124	84	117	118
Minn.	128	234	129	150	159	1.35	1.59	1.18	1.50	1.40	173	372	152	225	223
Iowa	65	74	75	100	140	1.75	1.65	2.10	2.20	2.50	114	122	158	220	350
Mo.	173	227	159	175	184	1.60	1.70	1.25	1.20	1.40	277	386	199	210	258
N. Dak.	263	321	273	218	305	1.56	1.60	1.35	.96	1.65	410	514	369	209	503
S. Dak.	90	76	71	67	127	1.62	1.31	1.20	1.20	1.60	146	100	85	80	203
Nebr.	178	156	151	158	180	2.30	1.98	1.91	1.51	2.12	409	309	288	238	382
Kans.	426	225	325	185	228	2.10	2.00	1.89	1.37	2.20	894	451	613	254	502
Del.	5	2	2	2	2	1.50	1.50	1.30	1.50	1.65	8	3	3	3	3
Md.	19	7	4	5	4	.90	1.10	1.08	1.10	1.40	17	8	4	6	6
Va.	103	112	112	123	92	1.11	1.40	.65	.90	1.22	114	157	73	111	112
W. Va.	100	134	161	118	155	1.08	1.22	1.05	1.05	1.25	108	163	169	155	194
N. C.	147	94	109	120	122	1.50	1.10	.70	1.00	1.00	220	103	76	120	122
S. C.	55	47	38	57	68	1.00	.74	.26	.80	.85	55	35	10	46	58
Ga.	129	100	68	102	122	.69	.69	.34	1.14	.88	89	69	23	116	107
Fla.	67	25	25	30	33	.90	.72	.76	.75	.65	60	18	19	22	21
Ky.	243	317	323	484	532	1.35	1.31	.92	1.11	1.20	328	414	298	537	638
Tenn.	323	425	340	478	358	1.00	1.01	.87	1.20	1.10	323	429	296	574	394
Ala.	191	164	150	159	160	1.04	.84	.85	1.21	.98	199	138	128	193	157
Miss.	143	117	123	137	146	1.31	.96	1.00	1.20	1.24	187	112	123	164	181
Ark.	154	188	172	172	215	1.20	1.10	.67	1.22	1.10	185	207	115	210	236
La.	41	60	60	66	69	1.49	.72	.92	1.40	1.10	61	43	55	92	76
Okla.	468	200	180	216	205	1.67	1.53	1.23	1.35	1.40	782	306	221	292	287
Tex.	554	623	573	543	514	1.58	1.16	.95	1.39	1.29	877	722	547	754	665
Mont.	94	110	105	94	113	1.56	1.34	1.00	1.20	1.45	147	147	105	113	164
Idaho	21	34	36	34	34	1.45	1.30	1.70	1.20	1.70	30	44	61	41	58
Wyo.	39	75	80	80	84	1.59	1.40	1.10	1.20	1.25	62	105	88	96	105
Colo.	110	126	109	110	121	2.14	1.87	1.88	1.30	1.50	235	236	205	143	182
N. Mex.	34	27	27	30	43	1.00	1.40	1.40	1.50	1.49	34	38	38	45	64
Ariz.	9	10	12	22	22	1.10	1.10	1.10	1.40	1.50	10	11	13	31	33
Utah	14	33	35	32	32	1.17	1.25	1.65	1.40	1.50	16	41	58	45	48
Nev.	30	40	41	40	40	1.33	1.00	1.70	1.20	1.10	40	40	70	48	44
Wash.	51	59	57	60	63	2.00	1.10	1.60	1.67	2.00	102	65	91	100	126
Oreg.	79	102	93	93	98	1.60	1.20	1.50	1.40	1.70	126	122	140	130	167
Calif.	53	86	80	70	70	1.30	2.10	2.20	2.10	2.00	69	181	170	147	140
U. S.	7,138	7,812	7,400	7,658	8,085	1.34	1.21	1.10	1.15	1.25	9,566	9,449	8,133	8,787	10,084

Bureau of Agricultural Economics. Estimated by the crop-reporting board.

[1] Preliminary.

TABLE 276.—*Hay, all: United States, stocks on farms, May 1, 1910–1927*

Year	Production of all hay preceding year	Stocks on farms May 1		Price per ton May 1	Year	Production of all hay preceding year	Stocks on farms May 1		Price per ton May 1
		Per cent	Stocks				Per cent	Stocks	
	1,000 short tons		*1,000 short tons*	*Dollars*		*1,000 short tons*		*1,000 short tons*	*Dollars*
1910	92,767	11.6	10,745	11.08	1919	91,139	9.4	8,559	22.31
1911	82,529	12.4	10,222	11.69	1920	105,398	10.2	10,707	24.22
1912	67,071	8.5	5,732	16.31	1921	107,245	17.9	19,160	13.08
1913	90,734	14.9	13,523	10.42	1922	97,849	11.2	10,969	12.98
1914	79,179	12.2	9,631	11.63	1923	111,879	12.0	13,379	12.69
1915	88,686	12.2	10,797	11.03	1924	106,611	12.0	12,835	13.69
1916	107,263	13.5	14,452	11.27	1925	112,481	13.9	15,645	12.32
1917	110,992	11.4	12,659	13.94	1926	98,441	11.7	11,481	12.95
1918	98,439	11.7	11,476	17.97	1927	96,065	11.3	10,819	13.23

Bureau of Agricultural Economics. Production and stocks are estimates by crop-reporting board; prices are based upon returns from special price reporters.

TABLE 277.—*Hay: Receipts at 12 markets, 1909–1926*

Year beginning July	Baltimore	Boston	Chicago	Kansas City	Milwaukee	Minneapolis	New York	Peoria	Philadelphia	Pittsburgh	St. Louis	San Francisco	Total
	Short tons	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*
Average:													
1909–13	63, 399	144, 674	305, 601	297, 787	39, 610	46, 350	318, 776	40, 496	83, 589	111, 863	241, 320	154, 134	1, 847, 597
1914–20	44, 827	95, 900	264, 783	420, 495	24, 816	31, 442	224, 989	36, 490	61, 151	81, 737	229, 995	104, 394	1, 624, 018
1921–25	17, 075	45, 664	154, 127	287, 220	15, 179	27, 592	83, 557	27, 100	41, 853	-------	133, 347	67, 445	950, 492
1909	58, 877	142, 930	256, 269	232, 368	29, 151	26, 310	334, 760	44, 118	83, 233	118, 497	200, 456	168, 220	1, 695, 189
1910	68, 273	162, 420	272, 104	308, 940	39, 934	66, 300	338, 860	37, 048	81, 529	116, 525	253, 932	184, 594	1, 930, 459
1911	68, 235	163, 220	352, 324	318, 948	43, 634	63, 570	292, 411	39, 361	95, 715	114, 951	259, 642	147, 483	1, 959, 494
1912	59, 785	139, 370	276, 137	243, 392	47, 756	37, 290	309, 322	39, 800	81, 853	107, 485	229, 713	141, 224	1, 813, 177
1913	61, 823	115, 430	371, 120	285, 288	37, 574	38, 289	318, 528	42, 151	75, 614	101, 858	262, 855	129, 147	1, 839, 668
1914	55, 623	116, 020	320, 071	398, 604	45, 698	45, 513	329, 686	38, 305	78, 583	83, 923	299, 550	161, 739	1, 973, 315
1915	50, 042	126, 400	280, 224	398, 172	34, 248	45, 306	296, 200	38, 792	88, 780	106, 910	223, 815	145, 373	1, 834, 262
1916	50, 794	123, 580	239, 062	359, 316	19, 748	35, 652	214, 064	47, 594	79, 006	94, 002	209, 902	108, 455	1, 581, 175
1917	63, 799	95, 170	351, 972	419, 964	21, 061	39, 126	200, 197	40, 800	60, 296	72, 963	238, 144	86, 228	1, 689, 720
1918	42, 249	70, 660	287, 217	386, 460	15, 778	29, 769	217, 300	35, 400	31, 487	73, 746	202, 812	80, 233	1, 473, 111
1919	32, 059	57, 270	225, 217	617, 052	18, 233	22, 607	170, 742	33, 400	49, 868	61, 551	256, 112	80, 775	1, 624, 886
1920	19, 223	82, 200	149, 718	363, 900	18, 943	23, 118	146, 734	21, 140	40, 036	79, 062	179, 633	67, 953	1, 191, 660
1921	14, 158	51, 080	142, 753	225, 516	17, 901	23, 718	102, 381	10, 970	51, 262	76, 162	119, 991	59, 185	895, 077
1922	16, 081	49, 190	150, 342	261, 064	17, 381	25, 956	98, 841	33, 060	42, 246	61, 769	138, 961	60, 017	954, 928
1923	25, 664	42, 910	146, 496	290, 676	17, 183	30, 432	85, 644	28, 900	49, 734	69, 267	138, 540	113, 235	1, 038, 681
1924	13, 635	46, 710	155, 158	316, 932	8, 906	28, 093	64, 332	28, 200	32, 824	44, 463	142, 184	50, 159	931, 596
1925	15, 839	38, 430	175, 885	341, 892	14, 524	29, 761	66, 587	34, 370	33, 199	(1)	127, 060	54, 629	[2] 932, 176
1926 [3]	12, 628	30, 680	129, 971	277, 020	8, 040	38, 258	52, 285	30, 140	29, 539	-------	85, 844	[4] 23, 165	[5] 717, 570

Bureau of Agricultural Economics. Compiled as follows: Baltimore—Baltimore Chamber of Commerce annual reports; Chicago—Board of Trade annual reports; Kansas City—Board of Trade annual reports; Minneapolis—Chamber of Commerce annual reports; New York—New York Produce Exchange, 1909–1924; St. Louis—Daily Market Reporter; other data from Hay Trade Journal, weekly.

[1] Reports discontinued June, 1925.
[2] Not including Pittsburgh.
[3] Beginning January, 1927, figures are subject to revision.
[4] Total for 6 months. Not reported July-December, 1926.
[5] Not including Pittsburgh, nor July-December, 1926, for San Francisco.

TABLE 278.—*Hay, tame; Estimated price per ton, received by producers, December 1, averages 1909–1913, 1914–1920, 1921–1925; annual 1924–1927*

State	Av. 1909–1913	Av. 1914–1920	Av. 1921–1925	1924	1925	1926	1927	State	Av. 1909–1913	Av. 1914–1920	Av. 1921–1925	1924	1925	1926	1927
	Dols.	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*		*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*
Me	13. 90	15. 53	14. 32	13. 00	12. 00	13. 20	12. 70	N. C	15. 84	19. 86	20. 20	21. 00	22. 00	20. 00	18. 00
N. H	16. 62	18. 39	20. 70	18. 50	18. 50	19. 00	16. 30	S. C	17. 04	21. 71	19. 50	22. 00	20. 00	20. 00	18. 00
Vt	13. 92	16. 23	17. 06	16. 10	13. 20	14. 50	11. 70	Ga	16. 82	19. 97	18. 34	19. 00	21. 00	18. 00	16. 30
Mass	20. 72	23. 34	24. 60	24. 00	23. 00	23. 90	21. 00	Fla	17. 36	18. 27	20. 20	20. 00	23. 00	22. 00	18. 20
R. I	21. 14	24. 81	25. 56	24. 00	23. 50	25. 00	22. 00	Ky	14. 50	18. 93	16. 74	18. 00	18. 70	16. 70	14. 50
Conn	20. 88	23. 10	25. 10	25. 00	24. 50	25. 70	21. 70	Tenn	14. 98	19. 53	18. 48	20. 00	22. 00	16. 60	15. 00
N. Y	15. 20	17. 40	15. 48	14. 50	14. 60	15. 00	11. 30	Ala	13. 66	16. 79	18. 02	19. 00	20. 00	18. 00	15. 00
N. J	19. 14	22. 96	20. 40	19. 00	20. 00	20. 30	17. 50	Miss	12. 14	15. 07	15. 94	17. 50	17. 70	16. 00	15. 00
Pa	16. 02	18. 91	17. 16	16. 00	17. 00	18. 50	13. 50	Ark	12. 06	15. 30	15. 30	16. 40	18. 00	16. 00	14. 00
Ohio	13. 62	17. 03	13. 40	12. 80	15. 20	14. 00	9. 20	La	11. 88	15. 40	15. 82	17. 80	19. 00	14. 50	13. 80
Ind	12. 94	16. 49	13. 56	12. 50	15. 50	14. 00	10. 40	Okla	8. 30	11. 80	12. 86	13. 30	16. 00	12. 00	10. 70
Ill	13. 12	17. 07	14. 04	13. 50	15. 90	16. 00	11. 40	Tex	11. 60	14. 93	14. 60	16. 80	18. 80	12. 00	11. 80
Mich	13. 56	17. 04	13. 24	12. 10	16. 50	13. 80	11. 00	Mont	10. 08	14. 34	9. 32	10. 00	10. 00	10. 50	8. 40
Wis	12. 70	15. 77	14. 20	13. 30	14. 00	15. 00	12. 50	Idaho	7. 84	13. 60	9. 26	12. 20	8. 50	9. 00	8. 70
Minn	8. 00	10. 20	10. 62	11. 50	11. 00	14. 20	9. 00	Wyo	9. 40	13. 33	8. 86	9. 80	8. 90	8. 50	9. 00
Iowa	9. 66	13. 78	11. 34	11. 40	13. 50	15. 50	12. 50	Colo	9. 76	12. 66	10. 48	11. 00	12. 00	8. 60	9. 20
Mo	11. 02	14. 94	11. 62	12. 00	12. 80	13. 50	9. 90	N. Mex	11. 24	15. 47	15. 72	15. 40	15. 00	12. 00	13. 40
N. Dak	6. 18	9. 57	7. 36	7. 60	7. 20	11. 00	7. 80	Ariz	12. 16	18. 67	15. 86	16. 30	17. 00	13. 00	14. 40
S. Dak	6. 66	8. 43	8. 38	8. 90	11. 00	13. 00	7. 60	Utah	8. 82	13. 96	8. 86	12. 00	9. 00	8. 00	9. 20
Nebr	8. 34	10. 74	10. 02	9. 60	12. 10	14. 00	8. 50	Nev	10. 10	13. 83	11. 00	14. 20	9. 00	10. 50	10. 00
Kans	8. 76	11. 80	10. 24	11. 20	12. 10	13. 00	8. 60	Wash	12. 54	17. 50	13. 84	15. 50	15. 00	12. 70	12. 90
Del	16. 60	20. 84	18. 90	17. 00	20. 00	18. 50	16. 50	Oreg	10. 14	14. 39	11. 86	13. 30	11. 60	11. 00	11. 20
Md	16. 36	20. 17	18. 52	16. 40	19. 00	20. 00	15. 40	Calif	11. 84	15. 49	15. 14	21. 70	14. 00	12. 30	12. 50
Va	15. 80	19. 91	18. 50	17. 80	21. 00	19. 50	16. 00								
W. Va	15. 64	20. 16	18. 36	17. 60	20. 00	19. 40	15. 00	U. S	12. 25	15. 43	13. 30	13. 77	13. 94	14. 09	11. 36

Bureau of Agricultural Economics. As reported by crop reporters.

TABLE 279.—*Hay, all (loose): Estimated price per ton, received by producers, United States, 1909–1927*

Year beginning July	July 15	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	Weighted av.
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Average:													
1909–1913	11.60	11.35	11.39	11.49	11.89	11.99	11.87	12.02	12.06	12.16	12.28	12.16	11.83
1914–1920	14.95	14.47	14.52	14.53	14.69	14.99	15.32	15.51	15.63	15.99	16.35	16.07	15.26
1921–1925	12.27	11.94	11.91	11.93	12.25	12.47	12.58	12.62	12.64	12.83	12.92	12.63	12.39
1909	10.12	9.70	9.85	10.19	10.42	10.48	10.90	11.48	11.57	11.30	10.96	10.80	10.58
1910	10.75	10.98	11.16	11.16	11.67	11.92	11.74	11.68	11.46	11.52	12.04	12.78	11.54
1911	13.51	13.73	13.58	13.57	13.95	14.02	14.07	14.52	15.15	15.98	16.26	15.27	14.36
1912	13.18	11.62	11.12	11.05	11.44	11.45	10.98	10.74	10.52	10.42	10.48	10.51	11.17
1913	10.45	10.74	11.24	11.48	11.97	12.06	11.68	11.68	11.60	11.58	11.64	11.46	11.49
1914	11.62	10.93	11.03	10.87	10.95	10.80	10.65	10.86	10.94	11.00	11.10	11.00	10.92
1915	10.52	10.07	9.89	9.90	9.92	9.97	10.31	10.65	10.80	11.06	11.37	11.28	10.34
1916	10.50	9.80	9.68	9.82	10.31	10.74	11.10	11.44	12.04	13.24	14.31	14.32	11.21
1917	13.43	13.08	13.54	14.50	15.85	17.32	18.48	19.01	18.91	18.32	17.55	16.60	16.60
1918	16.00	16.67	17.94	18.86	19.31	19.64	19.86	19.80	20.17	21.42	22.80	22.52	19.88
1919	20.94	20.34	20.16	19.58	19.40	20.00	21.16	22.04	22.62	23.58	24.54	24.24	21.34
1920	22.26	20.38	19.41	18.20	17.08	16.43	15.70	14.76	13.94	13.34	12.80	12.56	16.51
1921	12.17	11.72	11.53	11.24	11.19	11.29	11.34	11.58	12.05	12.64	12.82	12.28	11.83
1922	11.44	10.78	10.68	10.87	11.38	11.82	11.98	12.04	12.18	12.54	12.82	12.32	11.68
1923	11.78	11.98	12.25	12.44	12.75	13.15	13.59	13.60	13.63	13.73	13.65	13.75	12.93
1924	13.49	12.95	12.68	12.64	12.88	12.69	12.70	12.83	12.39	12.48	12.17	11.82	12.76
1925	12.48	12.25	12.42	12.47	13.07	13.40	13.31	13.03	12.97	12.78	13.12	12.98	12.77
1926	12.96	13.04	12.88	13.08	13.22	13.47	13.38	13.64	13.48	13.26	13.20	13.10	13.23
1927	11.71	9.97	10.51	10.63	10.54	10.55	------	------	------	------	------	------	--------

Bureau of Agricultural Economics. Based on returns from special price reporters. Mean of prices reported on 1st of month and 1st of succeeding month, July, 1909–December, 1923

TABLE 280.—*Hay, alfalfa: Estimated price per ton received by producers, United States, 1914–1927*

Year beginning July	July 15	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	Weighted av.
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1914	8.65	8.38	8.72	8.96	9.20	9.05	9.48	9.32	9.79	9.81	9.58	8.50	9.12
1915	8.28	8.28	8.22	8.14	8.72	9.52	9.89	10.35	10.74	10.73	10.56	10.49	9.39
1916	9.87	9.80	10.06	10.25	11.37	12.31	12.79	13.63	14.68	17.68	17.92	16.77	12.76
1917	14.13	15.28	16.33	17.59	19.19	20.39	21.27	21.38	20.82	18.97	17.84	16.74	18.42
1918	16.58	18.22	19.72	20.23	20.42	20.74	20.42	20.91	21.40	22.28	23.32	20.89	20.35
1919	20.15	20.72	20.89	20.56	21.63	22.95	24.13	24.41	24.68	24.57	25.68	24.20	22.70
1920	21.70	20.43	19.12	18.03	17.10	16.59	14.98	13.55	12.88	11.35	10.88	10.64	15.96
1921	9.85	9.66	9.86	9.82	9.67	10.46	10.55	11.04	11.80	12.39	12.28	10.98	10.58
1922	10.61	10.54	11.15	11.87	12.70	13.31	14.06	14.02	14.33	14.09	14.40	13.63	12.82
1923	12.45	12.01	12.78	13.37	13.59	14.39	13.99	14.08	13.98	14.09	14.12	13.70	13.54
1924	13.19	13.84	13.59	12.85	13.91	13.40	14.50	14.78	14.44	14.08	14.34	12.83	13.81
1925	13.02	13.00	12.91	13.41	13.74	14.14	13.90	14.24	13.50	13.53	13.17	13.33	13.52
1926	12.94	13.15	13.13	13.29	13.79	13.57	13.83	14.21	14.38	13.85	13.59	13.03	13.57
1927	11.73	11.47	11.34	11.52	11.75	12.02	------	------	------	------	------	------	--------

Bureau of Agricultural Economics. Based on returns from special price reporters.

TABLE 281.—*Hay, clover: Estimated price per ton received by producers, United States, 1914–1927*

Year beginning July	July 15	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	Weighted av.
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1914	11.85	12.09	12.44	12.47	12.70	12.76	13.07	13.36	13.41	13.65	13.79	12.78	12.83
1915	11.65	10.87	10.82	10.60	10.59	10.95	11.24	11.41	11.70	11.87	12.52	12.46	11.29
1916	10.84	9.93	10.01	10.08	10.46	10.86	11.38	11.65	11.90	13.06	13.94	14.22	11.33
1917	12.95	12.76	13.79	15.01	17.14	18.67	19.82	21.11	21.37	19.68	18.30	16.54	17.21
1918	15.73	17.18	19.27	20.60	21.13	21.26	21.69	21.11	21.25	23.36	25.33	25.48	20.93
1919	22.02	21.58	21.74	21.17	21.61	22.60	23.78	24.94	26.13	26.93	28.31	27.80	23.69
1920	24.62	22.82	22.57	21.29	20.60	19.96	19.17	17.39	16.44	15.47	14.90	14.52	19.48
1921	13.89	14.17	14.37	13.99	13.83	14.17	13.90	14.10	14.06	14.51	14.90	14.33	14.15
1922	12.82	12.66	12.54	12.51	12.67	13.03	13.39	13.35	13.24	13.47	13.58	13.70	13.03
1923	13.52	13.51	14.12	14.73	14.94	15.82	15.51	15.93	16.31	16.08	15.92	15.95	15.14
1924	15.45	14.00	13.75	13.65	13.64	13.45	13.25	13.30	12.52	12.41	12.67	12.26	13.43
1925	13.03	13.67	14.06	14.09	14.74	15.28	14.79	14.82	14.79	14.88	15.13	15.07	14.52
1926	14.40	14.25	14.60	14.71	14.76	15.24	15.71	16.16	15.64	15.51	15.21	14.65	15.06
1927	13.11	12.16	11.78	11.91	11.86	11.91	------	------	------	------	------	------	--------

Bureau of Agricultural Economics. Based on returns from special price reporters.

TABLE 282.—*Hay, timothy: Estimated price per ton, received by producers, United States, 1914–1927*

Year beginning July	July 15	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	Weighted av.
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1914	13.06	13.09	13.54	13.66	13.69	13.69	14.07	14.28	14.28	14.53	14.74	14.33	13.87
1915	13.43	12.39	12.32	12.14	12.24	12.73	13.11	13.39	13.61	14.00	14.50	14.71	13.09
1916	12.97	11.74	11.57	11.54	12.03	12.29	12.61	12.91	13.20	14.26	15.31	15.76	12.83
1917	14.68	14.11	14.89	16.23	18.33	20.31	21.37	22.25	22.53	21.47	20.40	18.55	18.67
1918	17.61	18.98	20.85	22.60	22.93	22.94	23.48	22.69	22.68	24.74	27.27	27.50	22.66
1919	24.22	23.89	23.65	23.04	22.90	23.71	24.59	25.49	26.75	27.99	29.92	30.05	25.13
1920	26.59	24.35	24.15	22.74	22.09	21.22	19.88	18.30	17.04	16.09	15.44	15.16	20.64
1921	14.51	15.01	14.83	14.39	14.22	14.31	14.51	14.77	15.06	15.52	16.10	15.75	14.82
1922	14.33	13.61	13.44	13.70	13.93	13.91	14.41	14.46	14.59	14.64	14.96	14.95	14.18
1923	14.86	14.68	15.13	16.22	16.78	16.95	16.96	17.25	17.53	17.53	17.48	17.52	16.53
1924	16.74	15.24	14.47	14.54	14.00	14.37	14.29	14.24	13.31	13.39	13.38	13.05	14.30
1925	13.89	14.06	14.98	15.11	15.38	15.87	15.82	15.79	15.59	15.81	16.31	16.64	15.40
1926	16.01	15.52	15.32	15.49	15.62	15.81	14.58	15.82	15.39	15.05	15.14	14.97	15.42
1927	13.29	12.03	11.70	11.58	11.67	11.31							

Bureau of Agricultural Economics. Based on returns from special price reporters.

TABLE 283.—*Hay, prairie: Estimated price per ton, received by producers, United States, 1914–1927*

Year beginning July	July 15	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	Weighted av.
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls*	*Dolls.*	*Dolls.*
1914	7.49	7.29	7.33	7.59	7.49	7.37	7.65	7.86	8.03	8.58	8.29	7.72	7.69
1915	7.37	6.83	6.64	6.44	6.75	6.95	7.38	7.34	7.39	7.56	7.71	7.97	7.13
1916	7.25	6.96	7.21	7.26	7.85	8.14	8.58	8.60	9.32	10.94	12.02	11.84	8.61
1917	10.11	10.82	11.40	12.29	13.32	14.91	15.39	15.74	15.47	14.47	12.75	12.78	13.31
1918	12.51	13.26	14.35	15.06	15.47	16.30	16.33	16.35	17.38	18.85	20.22	18.71	16.03
1919	16.10	16.10	15.90	15.88	16.91	17.19	17.54	17.36	16.52	16.66	18.06	17.59	16.78
1920	15.38	13.74	12.93	11.83	11.47	10.80	10.20	9.46	8.70	8.43	8.05	8.02	10.94
1921	7.67	7.50	7.52	6.78	7.49	7.47	7.39	7.67	7.94	8.02	8.24	8.40	7.62
1922	7.68	7.76	7.54	7.74	8.13	8.98	9.44	9.52	9.61	9.74	10.64	10.07	8.79
1923	9.17	8.97	8.58	9.19	9.07	9.26	8.84	8.87	8.66	8.78	8.74	8.54	8.92
1924	8.35	8.60	8.49	8.25	8.25	8.62	9.14	9.08	9.05	9.11	9.27	8.55	8.70
1925	8.93	8.55	9.21	9.41	9.39	9.78	9.73	9.53	9.48	9.08	9.54	9.59	9.36
1926	9.63	10.55	10.52	10.78	10.76	10.98	11.28	11.76	11.50	10.70	11.51	10.77	10.87
1927	9.15	8.65	7.98	7.67	7.47	7.55							

Bureau of Agricultural Economics. Based on returns from special price reporters.

TABLE 284.—*Hay, alfalfa No. 1: Average price per ton at Kansas City, 1910–1927*

Year beginning July	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Average
Average:	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1914–1920	19.02	21.29	20.97	21.87	23.61	24.19	24.29	23.83	23.71	24.43	24.17	21.98	22.78
1921–1925	17.74	19.04	19.73	21.92	22.30	22.32	22.71	21.52	22.76	23.67	22.99	18.21	21.24
1910	12.08	13.50	13.89	14.25	14.25	14.23	13.51	12.93	13.07	13.67	13.29	12.38	13.42
1911	15.13	14.44	14.87	15.00	15.27	15.50	17.72	18.37	20.49	22.73	19.34	11.62	16.71
1912	12.59	13.00	13.58	15.11	15.11	15.00	14.79	12.86	14.06	13.75	13.28	10.70	13.65
1913	12.12	14.80	16.14	16.54	16.00	16.01	15.96	15.25	15.18	15.30	15.54	14.23	15.26
1914	12.38	13.42	13.33	12.51	13.21	13.79	13.75	13.73	14.75	15.11	13.73	13.42	13.59
1915	11.54	11.90	12.25	13.11	12.83	14.35	14.54	15.34	13.92	14.44	14.45	11.42	13.34
1916	11.29	13.40	13.58	15.68	18.50	19.33	19.81	20.25	21.10	24.33	24.52	21.87	18.64
1917	21.18	24.09	24.07	27.43	31.10	32.76	30.01	31.33	27.56	24.11	22.64	20.57	26.40
1918	22.60	29.08	31.45	30.14	31.21	31.01	32.85	31.01	34.56	37.90	36.20	36.43	32.04
1919	26.93	27.63	24.86	30.24	33.39	35.10	35.75	34.83	33.79	34.10	35.46	31.75	31.99
1920	27.21	29.49	27.22	23.95	25.05	23.01	23.30	20.30	20.30	21.00	22.20	18.40	23.45
1921	17.50	19.00	17.20	19.80	20.40	19.60	20.00	19.60	22.10	22.50	22.10	15.40	19.60
1922	15.50	15.80	18.30	22.60	23.80	23.00	23.40	23.70	24.60	26.25	25.90	22.90	22.15
1923	18.90	20.90	22.80	24.90	24.80	24.90	25.30	23.50	24.70	26.10	24.50	18.00	23.28
1924	18.60	20.00	20.25	20.80	21.25	22.70	22.70	19.25	19.60	18.90	19.20	17.50	20.06
1925	18.20	19.50	20.10	21.50	21.25	21.40	22.15	21.56	22.81	24.62	23.25	17.25	21.13
1926	17.80	18.25	19.38	19.90	20.67	20.40	20.00	19.25	18.75	19.00	19.00	15.00	18.95
1927	14.75	15.25	18.00	19.50	20.00	22.25							

Bureau of Agricultural Economics. Compiled from Kansas City Daily Price Current and Kansas City Grain Market Review, average of daily range; 1925–1927 from reports made direct to the bureau.

TABLE 285.—*Hay, prairie No. 1: Average price per ton at Kansas City, 1910–1927*

Year beginning July	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Average
Average:	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1914–1920	15.35	15.71	16.00	16.27	17.20	17.21	16.90	16.48	17.66	18.96	19.53	18.23	17.12
1921–1925	12.04	11.30	11.97	13.56	13.26	12.95	12.73	12.44	13.04	14.21	14.72	14.23	13.04
1910	10.83	10.82	11.67	11.34	11.16	10.86	11.07	10.95	10.84	11.31	11.55	13.61	11.33
1911	15.93	12.93	11.50	11.60	12.07	12.61	13.84	13.66	16.70	20.85	20.48	15.16	14.78
1912	8.79	7.96	8.39	8.96	8.91	9.39	10.45	9.37	9.19	9.56	9.53	9.97	9.21
1913	10.60	13.62	15.76	16.00	15.66	15.57	14.20	14.50	14.40	16.00	16.42	15.43	14.85
1914	12.10	9.96	11.58	11.35	10.94	10.98	11.25	10.89	11.26	11.41	11.02	11.03	11.15
1915	11.32	8.65	8.63	9.71	9.54	8.97	8.84	9.15	8.96	9.50	9.74	8.65	9.30
1916	8.50	8.06	9.36	9.47	10.74	11.15	10.57	10.92	12.92	18.68	19.74	20.57	12.56
1917	18.14	18.57	18.06	19.60	25.07	25.47	24.00	23.79	23.42	21.13	19.17	17.66	21.17
1918	19.26	25.25	26.57	27.58	26.84	24.04	28.25	26.82	32.35	36.63	38.91	37.34	29.15
1919	20.89	19.98	19.32	19.75	21.12	25.34	21.40	20.68	20.64	21.70	24.02	18.95	21.15
1920	17.21	19.52	18.47	16.45	16.13	14.49	14.00	13.10	14.10	13.70	14.10	13.40	15.39
1921	12.30	11.40	11.30	12.40	12.00	11.30	11.10	10.30	11.50	11.90	12.40	11.90	11.65
1922	12.90	10.70	11.00	14.00	14.20	12.70	12.60	13.25	14.60	19.10	19.10	18.60	14.40
1923	11.80	11.50	13.80	14.60	14.75	14.75	14.80	14.50	14.80	14.50	13.90	12.50	13.85
1924	11.60	11.60	11.00	12.40	11.60	11.90	11.00	10.40	10.50	10.30	10.60	10.75	11.14
1925	11.60	11.30	12.75	14.40	13.75	14.10	14.15	13.75	13.81	15.25	17.62	17.38	14.16
1926	14.12	13.38	14.25	15.40	16.00	15.80	15.50	15.00	14.25	13.75	13.75	13.00	14.52
1927	10.50	10.00	10.25	11.50	11.00	11.50	------	------	------	------	------	------	--------

Bureau of Agricultural Economics. Compiled from Kansas City Daily Price Current and Kansas City Grain Market Review, average of daily range; 1925–1927 from reports made direct to the bureau.

TABLE 286.—*Hay, timothy No. 1: Average price per ton at Chicago, 1910–1927*

Year beginning July	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	Average
Average:	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1914–1920	23.39	24.86	23.68	23.54	23.71	23.25	23.59	22.88	23.83	25.33	26.16	24.50	24.06
1921–1925	24.40	24.52	24.42	24.12	24.05	23.50	23.73	22.85	23.63	24.55	24.37	24.31	24.04
1910	18.75	19.50	17.25	17.25	17.50	17.50	18.00	16.25	16.25	17.75	21.00	21.75	18.23
1911	23.50	21.50	20.00	20.50	21.25	21.00	21.75	20.75	21.50	24.00	26.00	21.25	21.92
1912	19.75	18.50	18.50	18.00	17.00	15.50	15.75	14.25	14.75	15.50	15.25	14.25	16.42
1913	15.00	17.75	17.75	18.00	17.00	16.25	15.50	14.75	15.25	16.00	16.25	15.25	16.23
1914	16.25	16.75	15.50	15.25	15.50	15.50	16.25	15.50	15.25	16.25	17.00	17.50	16.04
1915	19.25	20.25	19.00	17.00	15.50	15.50	16.25	15.50	16.75	18.75	18.75	18.00	17.54
1916	16.00	16.00	15.50	16.25	16.25	16.25	15.50	15.75	15.75	18.00	20.50	18.75	16.71
1917	17.75	19.25	21.00	25.00	27.25	27.00	28.25	29.00	28.00	24.00	23.00	19.00	24.04
1918	21.50	26.50	32.00	31.00	30.00	30.00	29.50	26.00	30.50	33.50	35.50	33.00	29.92
1919	34.50	35.00	29.00	28.00	29.50	30.00	32.50	34.00	35.25	43.00	46.50	42.75	35.00
1920	38.50	40.25	33.75	32.25	32.00	28.50	26.90	24.40	25.30	23.80	21.90	22.50	29.17
1921	24.40	24.00	24.20	22.60	22.90	21.90	22.50	21.80	23.00	26.80	25.70	23.60	23.67
1922	24.50	22.00	20.90	22.40	23.00	21.10	21.75	21.50	23.00	23.00	23.10	24.00	22.52
1923	24.00	25.20	26.60	26.50	26.80	27.10	26.80	24.80	25.30	26.20	26.30	25.20	25.90
1924	25.00	25.40	24.40	22.90	22.80	23.00	23.30	22.75	23.00	22.75	21.75	24.00	23.42
1925	24.10	26.00	26.00	26.20	24.75	24.40	24.30	23.40	23.25	21.00	25.00	24.75	24.68
1936	24.40	24.75	23.40	22.50	21.10	22.50	21.75	20.75	20.00	20.50	20.50	19.25	21.78
1927	18.25	19.75	18.25	18.00	18.25	18.00	------	------	------	------	------	------	--------

Bureau of Agricultural Economics. Compiled from Chicago Board of Trade and Daily Trade Bulletin, average of daily range; 1925–1927 from reports made direct to the bureau.

TABLE 287.—*Pasture: Condition, first of month, by States, 1925–1927*

State	1925						1926		
	May 1	June 1	July 1	Aug. 1	Sept. 1	Oct. 1	May 1	June 1	July 1
	Per cent	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Maine	82	85	90	93	82	75	75	75	81
New Hampshire	90	91	91	98	92	84	78	80	80
Vermont	91	89	99	101	98	94	75	75	88
Massachusetts	87	85	86	86	82	82	75	76	76
Rhode Island	90	85	85	90	81	79	68	79	75
Connecticut	84	84	86	90	88	84	60	75	68
New York	90	86	85	90	84	88	71	70	79
New Jersey	87	84	58	70	86	75	69	72	73
Pennsylvania	85	88	77	86	80	79	68	64	71
Ohio	81	74	61	75	74	72	65	77	80
Indiana	85	64	59	70	67	82	65	82	80
Illinois	87	68	66	67	64	75	72	75	78
Michigan	82	69	53	55	68	81	54	81	87
Wisconsin	84	70	84	86	70	83	72	86	85
Minnesota	84	70	91	88	65	74	65	64	64
Iowa	87	60	76	63	70	80	70	71	70
Missouri	92	83	82	72	72	72	75	72	75
North Dakota	86	75	94	80	67	70	60	66	60
South Dakota	89	58	80	70	52	57	52	54	46
Nebraska	92	84	86	67	75	75	68	70	70
Kansas	92	83	75	67	69	79	73	74	68
Delaware	88	80	35	50	70	55	68	68	63
Maryland	86	81	53	60	73	57	57	59	55
Virginia	78	78	58	52	53	47	65	62	59
West Virginia	85	84	78	83	73	59	64	68	74
North Carolina	84	80	70	57	46	48	71	59	63
South Carolina	75	65	59	52	30	36	72	48	54
Georgia	76	67	56	57	33	38	75	70	73
Florida	78	80	87	89	88	77	83	78	80
Kentucky	89	80	75	75	58	62	69	73	81
Tennessee	85	73	58	52	41	53	70	70	81
Alabama	78	72	55	61	48	46	75	81	84
Mississippi	75	67	64	66	61	63	77	81	78
Arkansas	76	69	57	68	54	63	81	75	70
Louisiana	70	65	69	68	62	68	85	87	88
Oklahoma	79	82	67	55	53	76	80	79	84
Texas	45	66	52	42	45	60	94	94	91
Montana	99	89	93	75	70	72	83	78	77
Idaho	94	99	97	91	90	90	96	91	79
Wyoming	97	94	95	89	88	86	93	95	88
Colorado	76	73	71	75	89	84	90	96	92
New Mexico	40	42	42	52	83	91	96	100	95
Arizona	65	75	65	75	80	77	103	95	96
Utah	91	94	92	93	89	92	93	95	76
Nevada	98	99	95	100	96	96	88	91	80
Washington	88	94	86	67	63	65	88	86	80
Oregon	92	102	94	85	75	85	95	94	85
California	97	90	95	93	90	89	94	92	88
United States	82.2	75.7	73.0	69.5	67.4	72.9	74.6	77.0	77.0

State	1926—Continued			1927					
	Aug. 1	Sept. 1	Oct. 1	May 1	June 1	July 1	Aug. 1	Sept. 1	Oct. 1
	Per cent	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Maine	84	72	70	88	90	90	95	93	89
New Hampshire	82	80	70	86	90	88	96	96	91
Vermont	93	91	86	90	94	96	97	96	90
Massachusetts	71	86	77	79	90	91	93	98	94
Rhode Island	72	85	75	83	85	89	93	97	91
Connecticut	65	81	84	83	87	93	95	97	94
New York	73	85	88	85	92	91	89	84	76
New Jersey	74	88	84	82	88	88	83	95	89
Pennsylvania	69	84	90	83	93	92	90	90	82
Ohio	72	89	96	86	94	95	91	89	78
Indiana	65	87	96	89	95	94	83	85	76
Illinois	65	82	92	90	93	92	87	84	78
Michigan	68	81	88	80	90	90	80	49	63
Wisconsin	76	82	88	82	91	93	86	61	74
Minnesota	55	71	79	86	90	98	90	74	80
Iowa	60	78	92	93	96	94	78	73	72
Missouri	62	76	92	90	94	95	90	93	77
North Dakota	52	54	66	79	86	98	96	91	82
South Dakota	40	54	60	80	90	98	93	86	80

TABLE 287.—*Pasture: Condition, first of month, by States, 1925–1927*—Contd.

State	1926—Continued			1927					
	Aug. 1	Sept. 1	Oct. 1	May 1	June 1	July 1	Aug. 1	Sept. 1	Oct. 1
	Per cent	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Nebraska	60	65	80	91	94	98	87	91	88
Kansas	55	50	74	90	82	92	87	95	93
Delaware	76	84	81	84	93	89	85	89	77
Maryland	60	79	86	83	92	93	82	88	80
Virginia	64	80	82	88	89	87	88	92	81
West Virginia	73	83	91	90	95	96	91	94	84
North Carolina	64	82	75	82	69	86	88	89	80
South Carolina	60	75	68	71	58	85	84	81	65
Georgia	74	86	81	76	62	80	87	79	68
Florida	88	90	90	66	52	76	84	87	81
Kentucky	70	91	92	92	95	96	89	89	71
Tennessee	69	91	85	91	89	93	80	86	66
Alabama	77	88	84	83	72	82	79	74	57
Mississippi	71	85	79	85	86	90	77	80	72
Arkansas	65	76	75	70	85	92	81	88	82
Louisiana	85	85	82	80	80	90	88	85	79
Oklahoma	83	81	84	88	79	84	78	92	86
Texas	91	87	83	91	78	90	86	73	77
Montana	67	67	72	72	95	107	102	100	98
Idaho	72	66	75	80	91	95	91	88	89
Wyoming	88	88	83	90	95	99	98	97	97
Colorado	87	80	74	88	75	89	88	97	93
New Mexico	90	80	75	72	65	75	74	92	87
Arizona	84	80	77	91	90	90	88	90	90
Utah	80	74	69	86	89	86	86	84	84
Nevada	77	68	65	81	87	93	88	89	91
Washington	60	63	77	85	93	96	85	78	92
Oregon	72	78	81	88	94	101	94	86	95
California	84	82	81	98	94	92	89	88	85
United States	69.9	78.2	83.7	87.0	88.3	92.8	86.9	84.2	80.1

Bureau of Agricultural Economics. Estimates by crop-reporting board.

TABLE 288.—*Hops: Acreage, production, December 1 price, imports, exports, and consumption in the United States, 1910–1927*

Year beginning July	Acreage	Average yield per acre	Production	Price per pound received by producers Dec. 1	Imports	Domestic exports	Net exports	Consumption by brewers [1]
	Acres	*Pounds*	*1,000 pounds*	*Cents*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
1910	(2)	(2)	(2)	----------	8,558	13,105	4,565	45,069
1911	(2)	(2)	(2)	----------	2,991	12,191	9,235	42,437
1912	(2)	(2)	(2)	----------	8,494	17,591	9,133	44,238
1913	(2)	(2)	(2)	----------	5,382	24,263	18,911	43,988
1914	(2)	(2)	(2)	----------	11,651	16,210	4,576	38,839
1915	44,653	1,187	52,986	11.7	676	22,410	21,869	37,452
1916	43,900	1,153	50,595	12.0	237	4,875	4,664	41,949
1917	29,900	983	29,388	33.3	121	3,495	3,411	33,481
1918	25,900	829	21,481	19.3	(3)	7,467	7,472	13,925
1919	21,000	1,189	24,970	77.6	2,696	30,780	28,187	6,441
1920	28,000	1,224	34,280	35.7	4,808	22,206	18,226	5,989
1921	27,000	1,087	29,340	24.1	893	19,522	19,116	4,453
1922	23,400	1,186	27,744	8.6	1,295	13,497	12,401	4,556
1923	18,440	1,071	19,751	18.8	761	20,461	19,832	3,815
1924	20,350	1,360	27,670	10.3	439	16,122	15,737	[4] 3,256
1925	20,350	1,404	28,573	21.8	581	14,998	14,592	[4] 3,426
1926	20,800	1,516	31,522	23.1	470	13,369	12,936	[4] 3,149
1927, preliminary	24,600	1,211	29,794	22.9	----------	----------	----------	----------

Bureau of Agricultural Economics. Compiled from reports of the Division of Crop and Livestock Estimates, Bureau of Foreign and Domestic Commerce, and records of the Bureau of Internal Revenue.

[1] Figures for 1919 and subsequent years represent hops used to make cereal beverages.
[2] Not available.
[3] Less than 500 pounds.
[4] Not including 57,936 pounds in 1924, 71,508 pounds in 1925, and 960 pounds in 1926 used in the manufacture of distilled spirits.

TABLE 289.—*Hops: Acreage, yield per acre and production in specified countries, average 1909–1913, annual 1924–1927*

Country	Acreage					Yield per acre					Production				
	Average 1909–1913 [1]	1924	1925	1926	1927, preliminary	Average 1909–1913 [1]	1924	1925	1926	1927, preliminary	Average 1909–1913 [1]	1924	1925	1926	1927, preliminary
	Acres	*Acres*	*Acres*	*Acres*	*Acres*	*Pounds*	*Pounds*	*Pounds*	*Pounds*	*Pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
North America:															
Canada [2]	[3] 718	507	507	594	[4] 1,500	1,429	1,604	1,673	1,626	1,333	[3] 1,026	813	848	966	[4] 2,000
United States [5]	[6] 45,000	20,350	20,350	20,800	24,600	[6] 1,103	1,360	1,404	1,515	1,211	53,654	27,670	28,573	31,522	29,794
Total	45,718	20,857	20,857	21,394	26,100						54.680	28,483	29,421	32,488	31,794
Europe:															
England and Wales	33,797	25,897	26,256	25,599	23,004	977	1,925	1,514	1,453	1,244	33,021	49,840	39,760	37,184	28,616
Belgium	5,313	3,123	3,158	3,501	3,323	1,319	1,754	1,776	1,432	1,339	7,008	5,478	5,609	5,012	4,448
France	17,072	10,052	10,267	10,939	11,977	788	1,113	1,078	812	962	13,459	11,187	11,069	8,881	11,521
Germany	56,267	28,738	30,821	35,012	39,537	515	432	345	159	401	28,961	12,418	10,646	5,562	15,873
Austria	[7] 6,210	264	277	279		[7] 573	352	386	308		[7] 3,560	93	107	86	
Czechoslovakia	38,385	20,242	22,343	25,911	31,131	599	1,085	694	721	694	22,997	21,967	15,508	18,686	21,609
Hungary	[7] 628	178	107	86		[7] 814	596	617	523		[7] 511	106	66	45	
Yugoslavia	3,749	5,503	5,019	10,210	21,098	725	876	486	370		2,718	4,818	2,439	3,781	
Rumania	[7] 664	[4] 371				[7] 825	593				[7] 548	[4] 220	[4] 207		
Poland	11,963	4,964	6,175	5,263		493	653	548	601		5,897	3,243	3,383	3,164	
Russia											6,797				[8] 6,753
Total all countries reporting for all periods shown	154,583	93,555	97,864	111,172	130,070						105,446	100,890	82,592	75,325	82,067
Oceania:															
Australia	1,251	1,806				1,285	1,495				1,607	2,700	[4] 1,680	[4] 1,680	
New Zealand	[6] 653	738	648			[9](1,455)	1,542	1,159			[9] (950)	1,138	751		
Total countries reporting acreage and production for all periods shown	196,552	108,909	113,702	122,356	135,072	[10] 815	[10] 1,188	[10] 985	[10] 881	[10] 843	160,126	129,373	112,013	107,813	113,861
Estimated world total, exclusive of Russia [11]	222,000	123,000	128,000	141,000							176,000	142,000	121,000	117,000	

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture except as otherwise stated. Production figures are for the crop harvested in the calendar year in the Northern Hemisphere and the succeeding harvest in the Southern Hemisphere.

[1] Figures for Europe are estimated for present boundaries.
[2] British Columbia.
[3] 2-year average.
[4] Unofficial.
[5] Principal producing States.
[6] 1 year only.
[7] 4-year average.
[8] Production in Ukraine where the bulk of the crop is grown, as reported in Economic Life.
[9] Rough estimate of production for 1 year based on acreage for that year and yield in later years.
[10] Average yield in 5 European countries, Canada, and the United States.
[11] Exclusive of acreage and production in minor producing countries for which no data are available.

TABLE 290.—*Hops: International trade, average 1909–1913, annual 1923–1926*

Country	Year ended Dec. 31									
	Average, 1909–1913		1923		1924		1925		1926, preliminary	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
PRINCIPAL EXPORTING COUNTRIES	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Czechoslovakia	--------	--------	526	6, 826	2, 647	19, 317	1, 787	12, 389	1, 195	16, 221
France	5, 436	335	3, 807	4. 513	4, 081	8, 108	4, 015	9, 114	3, 931	6, 159
New Zealand	61	352	16	282	3	663	2	340	18	393
Poland	--------	--------	152	1, 548	719	624	303	1, 661	330	1, 850
United States	6, 235	15, 416	1, 018	20, 041	406	17, 391	592	20, 655	568	12, 833
Yugoslavia	--------	--------	[1] 339	5, 078	[1] 192	2, 817	[1] 298	[1] 6. 964	[1] 169	[1] 6, 945
PRINCIPAL IMPORTING COUNTRIES										
Argentina	618	--------	996	--------	538	--------	1, 142	--------	[1] 1, 000	--------
Australia	1, 106	22	[2] 222	[2] 955	[2] 168	[2] 3	[1] 168	[1] 3	[1] 409	[1] 91
Austria	[3] 938	[3] 18,333	3, 263	140	2, 881	[1] 156	3, 058	[1] 127	2, 977	130
Belgium	6, 915	4, 814	4, 673	2, 389	3, 800	3, 664	5, 381	3, 964	4, 527	3, 199
British India	246	--------	294	--------	164	--------	171	--------	209	--------
Canada	1, 396	176	4, 240	1, 182	2, 064	700	3, 524	85	2, 165	357
Denmark	1, 027	[4] 1	489	8	755	5	674	[1] 1	812	1
Germany	7, 688	17. 564	2, 056	4, 250	14, 003	2, 217	12, 388	1, 666	15, 953	1, 156
Hungary	--------	--------	74	92	412	103	275	82	356	123
Irish Free State	--------	--------	--------	--------	8, 156	--------	6, 758	--------	6, 575	--------
Italy	529	10	504	13	669	52	732	14	816	13
Japan	253	--------	924	--------	1, 209	--------	908	--------	798	--------
Netherlands	2, 938	1, 405	1, 228	716	1, 294	317	961	207	931	135
Norway	289	--------	362	--------	384	--------	402	--------	349	--------
Russia	1, 258	2, 348	[1] 72	--------	[1] 401	--------	[1] 542	--------	--------	--------
Sweden	987	1	1, 040	3	947	12	978	--------	971	2
Switzerland	1, 257	[5] 2	521	--------	843	--------	828	--------	977	--------
Union of South Africa	487	--------	398	--------	304	--------	466	--------	577	(6)
United Kingdom	21, 028	2, 162	1, 356	2, 470	10, 039	4, 963	10, 114	4, 989	3, 924	8, 800
Total, 25 countries	60, 692	62, 941	28, 570	50, 506	57, 079	61, 112	56, 472	62, 261	50, 537	58, 408

Bureau of Agricultural Economics. Official sources except where otherwise noted. Lupulin and hopfenmehl (hop meal) are not included.

[1] International Yearbook of Agricultural Statistics.
[2] Year beginning July 1.
[3] Average for Austria-Hungary.
[4] 3-year average.
[5] 1 year only.
[6] Less than 500 pounds.

TABLE 291.—*Peanuts: Acreage, production, and value, United States, 1916–1927*

Year	Acreage	Average yield per acre	Production	Price per pound received by producers Nov. 15 [1]	Farm value	Value per acre [1]
	1,000 acres	*Lbs.*	*1,000 lbs.*	*Cents*	*1,000 dollars*	*Dollars*
1916	1, 043	881. 1	919, 028	4. 5	41, 243	39. 54
1917	1, 842	777. 7	1, 432, 581	6. 9	98, 512	53. 48
1918	1, 865	664. 9	1, 240, 102	6. 5	80, 271	43. 04
1919	1, 132	691. 9	783, 273	9. 3	73, 094	64. 57
1920	1, 181	712. 5	841, 474	5. 3	44, 256	37. 47
1921	1, 214	683. 1	829, 307	4. 0	33, 097	27. 26
1922	1, 005	630. 0	633, 114	4. 7	29, 613	29. 47
1923	896	722. 9	647, 762	6. 8	43, 918	49. 02
1924	1, 187	627. 7	745, 059	4. 6	34, 259	28. 86
1925	958	729. 1	698, 475	3. 6	25, 390	26. 50
1926	843	749. 5	631, 825	4. 5	28, 161	33. 41
1927 [2]	1, 128	715. 4	805, 990	4. 0	32, 501	28. 81

Bureau of Agricultural Economics. Estimates by the crop-reporting board.

[1] Farm prices and values are as of Nov. 15, 1916–1923; Dec. 1, 1924–1927.
[2] Preliminary.

TABLE 292.—*Peanuts: Acreage, production, and December 1 price, by State, 1924–1927*

State	Acreage				Average yield per acre				Production				Price per pound received by producers, December 1			
	1924	1925	1926	1927 [1]	1924	1925	1926	1927	1924	1925	1926	1927 [1]	1924	1925	1926	1927
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
Va.	120	138	138	152	650	1,040	990	764	78,000	143,520	136,620	116,128	5.5	4.0	4.3	4.5
N. C.	195	185	180	207	900	1,150	1,030	761	175,500	212,750	185,400	157,527	5.4	3.9	4.2	4.5
S. C.	17	11	8	11	650	430	675	775	11,050	4,730	5,400	8,525	5.0	3.8	5.2	3.7
Ga.	399	278	211	304	600	500	525	725	239,400	139,000	110,775	220,400	4.2	3.4	4.9	3.9
Fla.	47	41	39	44	710	600	680	640	33,370	24,600	26,520	28,160	4.0	3.2	4.5	3.7
Tenn.	23	20	20	20	788	815	900	850	18,124	16,300	18,000	17,000	3.5	3.4	3.5	4.2
Ala.	270	180	140	220	500	560	570	680	135,000	100,800	79,800	149,600	4.1	3.2	4.5	3.4
Miss.	14	14	8	9	480	595	650	725	6,720	8,330	5,200	6,525	3.9	3.0	5.7	6.0
Ark.	10	10	10	11	535	496	675	800	5,350	4,960	6,750	8,800	4.2	3.1	6.0	6.0
La.	9	9	10	13	355	640	552	625	3,195	5,760	5,520	8,125	4.2	3.5	6.2	6.1
Okla.	8	7	8	20	700	700	800	800	5,600	4,900	6,400	16,000	4.3	3.2	4.5	3.5
Tex.	75	65	71	117	450	505	640	600	33,750	32,825	45,440	70,200	4.5	3.4	4.5	3.5
U. S.	1,187	958	843	1,128	627.7	729.1	749.5	715.4	745,059	698,475	631,825	806,990	4.6	3.6	4.5	4.0

Bureau of Agricultural Economics. Estimates by the crop-reporting board.

[1] Preliminary.

TABLE 293.—*Peanuts: Estimated price per pound, received by producers, United States, 1910–1927*

Year beginning November	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	July 15	Aug. 15	Sept. 15	Oct. 15	Weighted av.
Average:	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
1910–1913	4.6	4.6	4.5	4.7	4.8	4.9	4.9	5.1	5.0	5.0	5.0	4.6	4.6
1914–1920	5.9	5.7	5.9	6.1	6.2	6.4	6.7	6.8	6.8	6.4	6.3	5.7	5.9
1921–1925	5.4	4.9	5.2	5.5	5.7	5.7	5.7	5.8	5.7	5.6	5.7	5.3	5.2
1910	4.7	4.5	4.4	5.0	4.8	4.9	4.8	5.2	5.0	5.3	5.1	4.6	4.6
1911	4.4	4.4	4.3	4.7	5.0	4.9	4.9	5.2	4.9	5.0	4.8	4.7	4.4
1912	4.7	4.6	4.6	4.5	4.7	4.8	4.7	5.0	5.1	4.9	4.9	4.8	4.6
1913	4.4	4.8	4.7	4.7	4.7	4.9	5.1	5.1	5.2	4.9	5.0	4.5	4.6
1914	4.4	4.3	4.5	4.4	4.2	4.5	4.8	4.8	4.7	4.5	4.4	4.3	4.4
1915	4.2	4.2	4.3	4.4	4.4	4.6	4.6	4.7	4.6	4.6	4.4	4.4	4.3
1916	4.4	4.7	4.9	5.3	5.5	6.2	7.2	7.7	7.6	7.2	6.6	6.1	4.8
1917	7.1	7.1	7.0	7.2	7.4	8.3	8.2	7.9	7.8	7.9	8.3	6.9	7.1
1918	6.6	6.1	6.0	6.9	7.0	6.9	7.2	7.7	8.2	8.1	8.3	8.1	6.5
1919	9.1	9.1	9.9	10.5	11.2	10.9	11.2	11.2	11.0	8.5	8.0	5.8	9.2
1920	5.3	4.7	4.4	4.1	4.0	3.5	3.4	3.8	3.8	3.9	4.0	4.0	4.7
1921	3.7	3.5	3.6	4.0	4.3	3.9	3.9	4.2	4.4	4.4	4.7	3.6	3.7
1922	5.2	5.0	5.9	6.5	6.7	7.1	7.1	7.3	6.9	6.7	6.7	7.0	5.5
1923	6.8	6.2	6.4	6.7	6.8	6.7	6.4	6.5	6.4	6.6	6.4	6.4	6.5
1924	6.3	5.6	5.4	5.5	5.9	5.7	6.2	6.2	5.4	5.2	5.7	4.7	5.7
1925	5.1	4.4	4.5	4.7	4.6	5.1	5.0	4.7	5.3	5.3	5.1	4.9	4.7
1926	4.6	4.7	4.9	5.4	5.6	5.7	5.9	6.6	6.4	6.4	6.0	4.9	4.8
1927	4.6	5.2											

Bureau of Agricultural Economics. Based on returns from special price reporters.

TABLE 294.—*Peanuts: Monthly average prices of cleaned and shelled peanuts, f. o. b. important shipping points, 1920–1927*

VIRGINIA-NORTH CAROLINA SECTION[1]

	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
Cleaned Virginias, Jumbos:	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
1920–21	12¾	11⅛	11⅛	11	10⅝	10⅜	11	12	12	11⅞	11¾	11¾
1921–22	10¼	8	7⅞	7⅛	6⅝	5⅞	5⅝	5⅞	5⅞	6	6	6⅝
1922–23	9¼	10¾	11¼	11	10¾	10⅝	10⅝	10⅜	10¼	9½	9½	9⅝
1923–24	9¼	8½	8⅝	8⅝	8½	8½	8⅝	8⅝	9½	10⅝	10⅜	10¼
1924–25	9⅞	9¾	10⅜	11½	11½	11⅜	11¼	11⅜	11½	11½	11½	10¾
1925–26	9¼	7⅞	7⅞	7⅞	7½	7¼	7⅞	7½	7¾	7¾	7½	7½
1926–27	7⅛	7¼	7¾	7⅞	7⅞	7⅝	7⅝	7⅞	8⅝	9⅞	10⅝	10⅝
Fancys:												
1920–21	6⅞	5¾	6½	6⅝	6¼	6⅜	6⅝	7½	7⅛	7	6⅞	6⅞
1921–22	7	6⅝	7⅛	6⅝	6⅜	5⅝	5⅛	5	4⅞	5	4⅞	5
1922–23	7	7¾	7⅞	7⅞	7¾	7⅝	7½	7⅜	7	6⅝	6⅜	6¾
1923–24	6⅝	6⅞	7	7⅛	7	7	7¼	7⅜	8⅝	9⅛	9⅛	9
1924–25	8⅞	8⅞	9⅝	10⅜	10⅜	10¼	10⅛	10⅛	9⅝	9½	8⅝	7¾
1925–26	7⅛	6½	6⅝	6¾	6⅝	6⅜	6⅛	6½	6¾	6¾	6½	6⅜
1926–27	6¼	6⅜	6⅝	6¾	6¾	6⅝	6½	6⅝	7¼	7⅝	7⅞	7¾
Extras:												
1920–21	5¾	5	5	5	4⅝	4½	4⅝	5¼	4⅞	4¾	5	4⅞
1921–22	4⅞	4¼	4⅜	4¼	4⅛	3⅞	3¾	3⅞	3⅞	4⅛	4⅛	4⅛
1922–23	5½	6	6⅝	6⅞	6⅞	6⅞	6⅞	6⅞	6⅝	6¼	6⅛	6¼
1923–24	6⅛	6	6⅛	6¼	6¼	6⅜	6⅜	6⅝	7⅜	8⅛	8⅛	8
1924–25	7⅝	7⅝	7⅞	8⅝	8⅜	8⅜	8	7⅞	7⅞	7⅝	7	6¾
1925–26	6	5½	5½	5¾	5¾	5⅝	5⅝	5¾	5¾	6	6	5¾
1926–27	5½	5⅝	5⅞	6	6	6	5⅞	6	6⅜	6⅞	6¾	6⅝
Shelled Virginias, Extra Large:												
1920–21	12½	11⅝	12¼	12¾	12½	12⅜	12⅝	12⅜	12¼	12	12	11¾
1921–22	10⅝	8¾	8⅞	8½	8¾	8⅛	7¾	7½	7⅝	8⅜	8¼	8⅜
1922–23	9½	12	14½	13⅜	12¾	12½	12⅜	12¼	12	11½	11⅛	11⅜
1923–24	10⅞	9¾	10⅛	10⅜	10⅜	10⅝	10⅜	10⅜	11⅝	12¾	12⅝	12⅜
1924–25	12	11⅞	12¾	13¾	13¾	13½	13¼	13¼	13	12⅝	12½	11⅜
1925–26	9½	9	9¼	9⅜	9¼	9¼	9	9½	9⅞	9¾	9⅝	9¼
1926–27	9⅛	9	9⅜	9⅞	10¼	10⅛	9¾	10	11⅜	13	14⅛	14
No. 1:												
1920–21	7¼	5⅛	5⅛	5	4⅝	4⅝	4¾	5⅛	4⅞	5½	7⅛	7½
1921–22	7	5⅞	5⅝	5⅜	5⅞	5½	5½	6⅛	6½	7¼	6¾	6⅝
1922–23	7⅜	8½	9¾	10⅜	10⅛	10¼	10⅜	10½	9¾	9	8⅞	9⅝
1923–24	9⅛	8¾	9	9¼	9⅜	9⅝	9⅜	9½	10¾	11⅝	11⅜	10⅝
1924–25	9½	8⅞	9⅛	9⅞	9¾	9½	9⅜	9⅜	9⅝	9½	9½	9
1925–26	7⅞	7¼	7½	8½	8⅜	8⅜	8⅛	9⅛	9½	9⅜	9⅛	8½
1926–27	8	7¾	8½	8⅞	8⅞	8⅝	8½	8⅝	9	8⅞	8	7⅝
No. 2:												
1920–21	4⅜	3¾	3⅜	3½	3⅛	2¾	2¾	2⅞	2⅝	3⅛	4¼	4¼
1921–22	4⅛	3¼	3½	3½	4½	4½	4½	5	5¼	5⅞	5½	5¼
1922–23	4⅞	6½	7¼	8⅜	8⅝	8⅝	9¼	9¼	8⅞	8	7⅝	8
1923–24	7⅞	7¼	7½	7¾	7⅝	7⅝	7⅜	7¼	7¾	8¼	8	7⅜
1924–25	6⅞	6¼	6	6⅛	5⅞	5½	5¼	5¼	4⅞	4¾	4¾	4½
1925–26	4¾	4¾	5⅜	6	7	7¼	7	7¼	7	6⅝	6	5¾
1926–27	5⅜	5⅝	6½	7¼	8	7⅞	7⅝	7¾	8	7⅞	6⅝	5¾

SOUTHEAST SECTION: SOUTH CAROLINA, GEORGIA, ALABAMA, AND FLORIDA[2]

	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
Shelled Spanish, No. 1:												
1920–21	7¼	5⅝	5¾	5¾	4⅞	4⅞	4½	4½	4¼	4⅞	5⅞	5⅞
1921–22	5⅜	5	5⅛	5½	6	5⅞	6⅛	7⅛	7¾	8¼	7½	6⅞
1922–23	9¼	9½	10¾	11¾	11⅜	12⅛	12½	12⅝	12¾	12½	12¼	11⅞
1923–24	11¾	11½	11¾	11¾	11⅜	11⅛	11	11	11⅝	12⅛	10⅜	8¾
1924–25	8¼	8⅛	8⅛	8½	8¾	8	7¾	7¾	7½	7⅜	7¼	6¾
1925–26	6¾	6⅝	7⅝	8⅝	8½	8¼	8⅜	9	9¼	9¼	9⅜	8⅜
1926–27	9	9¼	10	10¾	10⅞	10¾	10⅝	10⅜	10¼	9½	6¾	6⅜
Spanish, No. 2:												
1920–21	5¼	4⅛	4¼	4	3¼	3¼	2⅞	3⅛	2¾	3⅞	4¼	4⅜
1921–22	4⅛	3¾	3⅞	4¼	5¼	5¼	5¼	5⅞	6⅝	6⅞	6½	5⅝
1922–23	7⅝	7¾	9⅛	9¾	9⅞	10⅜	10¾	10½	10¼	9⅝	9⅛	10⅛
1923–24	10½	10½	10⅜	10⅝	10⅛	9¾	9	8¼	8⅝	9¼	8¼	7⅜
1924–25	7¼	7	6⅞	6⅞	6⅝	5¾	5¾	5⅞	5⅝	6	6	5⅝
1925–26	5¾	5⅝	6⅛	7⅜	7⅝	7⅜	7¼	7¾	7⅝	7⅜	7½	7½
1926–27	7⅝	7⅝	8¼	8⅞	8⅞	8¾	8⅝	8⅛	7⅞	7⅜	6	5⅝

[1] Important shipping points: Suffolk, Franklin, Petersburg, and Norfolk, Va., Edenton and Enfield, N. C.
[2] Important shipping points: Albany, Cordele, Donalsonville, Fort Gaines, and Savannah, Ga., Dothan, Enterprise, Montgomery, Samson, and Troy, Ala.

TABLE 294.—*Peanuts: Monthly average prices of cleaned and shelled peanuts, f. o. b. important shipping points, 1920–1927*—Continued

SOUTHEAST SECTION: SOUTH CAROLINA, GEORGIA, ALABAMA, AND FLORIDA—Continued

	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
Runners, No. 1:	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
1920–21	5½	4⅛	4¼	4	3¼	3¼	3	3¼	3⅜	4⅝	5	5
1921–22	4¾	4⅜	4⅝	5⅛	5⅞	5¾	5⅝	6½	6¼	6⅝	6¾	6⅝
1922–23	7½	7⅞	9⅛	9¾	9⅜	10⅛	10¼	10⅛	9⅞	9¾	------	9⅛
1923–24	9	8⅝	9¼	9½	9	8½	8¼	8⅛	9¼	10⅛	9⅜	7¾
1924–25	7¼	7⅛	7¼	7¾	7⅝	7⅛	7	7¼	7⅜	7⅜	7⅜	6⅞
1925–26	6¾	6½	7	8	8	8	7¾	8¼	8¼	------	------	7½
1926–27	7⅞	7¾	8⅞	9⅞	9¾	9½	9⅛	8⅜	8⅜	8	------	5⅞
Runners, No. 2:												
1920–21	4	3¾	3⅝	3⅜	2¾	2¾	2½	2⅝	2⅝	------	3⅞	4¼
1921–22	3⅝	3⅝	3⅝	3¾	5	------	------	------	------	4	5¾	------
1922–23	------	7	8⅛	8⅜	8⅝	9⅝	9⅜	9¼	8⅞	8½	------	8½
1923–24	8¼	7⅞	8¼	8¼	8	7½	7¼	7⅛	8¼	8⅞	7⅞	7⅛
1924–25	6½	6⅛	6	6⅜	6½	5¾	5¼	5⅝	5⅜	5⅜	5½	5¼
1925–26	5⅜	5¼	5½	6½	7	7⅛	7⅛	7⅛	7½	------	------	------
1926–27	6⅞	6⅞	7⅜	7⅞	7⅞	7⅞	------	------	------	------	------	5⅜

TEXAS [3]

	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
Shelled Spanish, No. 1:												
1920–21	7½	6⅛	5⅞	6⅜	5½	5⅞	5⅞	5⅝	5¾	6¼	6¼	5⅞
1921–22	5½	5¼	5⅜	5¾	6⅜	6¼	6¼	7⅝	8⅛	8⅜	8	7⅜
1922–23	9⅛	9¼	10¾	11⅞	11¾	12½	12⅝	------	13	13	13	13⅛
1923–24	12½	11⅝	11¾	11⅞	11⅝	11¼	11	11	11⅝	12⅜	11¼	9¼
1924–25	8⅞	8⅞	8⅝	9⅛	9¼	9⅛	9	8⅞	9	8¾	8⅝	8¼
1925–26	7⅝	7¼	8	9⅛	9	9	9	9½	9¾	10	9⅞	9
1926–27	9⅛	9⅜	10⅜	11⅝	11⅞	11¾	11⅝	11½	11⅜	10¼	7⅜	6¾
Spanish, No. 2:												
1920–21	5½	4⅜	4¼	4⅜	3¾	3¼	4	4	4	4¼	4⅝	4⅜
1921–22	4⅜	4	4¼	4⅝	4⅜	5¼	5¼	6	6⅜	7¼	7	6⅞
1922–23	7⅜	7⅞	9⅛	10¼	10¼	10½	10⅞	------	10¾	10½	10½	10¼
1923–24	10½	10⅝	10⅝	10⅝	10¼	9⅝	9	8⅝	8⅞	9¼	9⅛	8¼
1924–25	7⅛	7⅝	7¼	7½	7⅝	7⅛	7¼	7⅛	7	6⅝	6⅞	6¾
1925–26	6⅝	6¼	6¾	7¾	7¾	8	7⅞	8¼	8½	8¾	8½	8
1926–27	8⅛	8¼	8¾	9½	9¾	9¾	9⅜	9⅜	9⅛	8¼	6⅜	6

Bureau of Agricultural Economics. Based on returns from cleaners, shellers, and brokers. Crop year extends from November to next October in the Virginia-North Carolina section; farther south it begins earlier.

[3] Important shipping points: Fort Worth and De Leon, Tex.

TABLE 295.—*Peanuts used in the production of oil in the United States, 1919–1926*

Year beginning Oct. 1	October-December	January-March	April-June	July-September	Total
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
1919	4,364	5,867	9,214	15,770	35,215
1920	27,414	27,962	32,923	23,480	111,779
1921	40,338	44,152	25,964	4,703	115,157
1922	13,169	9,081	8,436	941	31,627
1923	6,164	4,676	5,471	1,928	18,239
1924	17,668	24,678	16,893	9,096	68,335
1925	17,134	17,880	10,668	4,389	50,071
1926, preliminary	10,576	11,143	6,321	6,966	35,006
1927, preliminary	21,810	------	------	------	------

Bureau of Agricultural Economics. Compiled from reports of the Bureau of the Census. Quantities reported in terms of "hulled" have been converted to "in the hull" basis by multiplying by 1.5.

TABLE 290.—Peanuts: International trade, average 1911–1913, annual 1923–1926

Country	Year ended Dec. 31									
	Average, 1911–1913		1923		1924		1925		1926, preliminary	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
PRINCIPAL EXPORTING COUNTRIES										
Anglo-Egyptian Sudan		1,961		13,296		22,987	[1] 1	26,021		21,773
Brazil		274		4,492		435		195		[1] 18
British India		503,448		597,356		550,505		1,036,670		994,900
China	32,882	138,472	23,390	391,183	31,924	661,267	22,800	530,227	6,577	534,488
Dutch East Indies	612	60,282	577	39,876	511	43,099	518	43,848		[1] 39,684
French Possessions in India		306,701		178,139		[1] 108		[1] 152		[1] 150
Gambia		131,912		140,143		[1] 135,792		[1] 109,087		[1] 136,800
Guinea (French)	1	4,863		3,459		[1] 2,768	[1] 11	[1] 8,903		[1] 7,744
Mozambique	[2] 1,098	[2] 15,907	35	24,346	56	29,669	5	24,525	20	47,472
Nigeria		17,163		51,267		175,316		[1] 284,983		[1] 284,027
Senegal	[2] 168	425,937	([1, 3])	637,647	[1] 4	[1] 701,707	[1] 47	[1] 985,409	[1] 114	[1] 1,066,899
Spain		9,205		8,790		7,395		4,574		3,665
Tanganyika		[4] 9,275		36,978		9,056		[1] 30,424		[1] 53,313
PRINCIPAL IMPORTING COUNTRIES										
Algeria	7,022	218	5,811	158	7,906	259	8,066	387	7,387	331
Argentina	8,667		4,485	12,125	554	2,883	4,967	326	[1] 5,343	[1] 41
Belgium	[2] 68,422	[2] 43,393			3,341	13	32,839	438	88,836	165
British Malaya	[4] 19,488	[4, 5] 10,839	12,674	2,106	14,941	2,006	23,737	6,259	19,536	3,927
Canada	7,302		21,963		22,283		23,793		28,946	
Denmark	5,236		22,155		20,178		27,290		31,319	
Egypt	4,664	1,637	6,336	3,711	7,406	4,504	13,863	3,925	9,858	3,660
France	1,239,659	47,107	1,410,553	15,098	1,359,166	17,760	1,503,887	16,082	1,516,072	14,668
Germany	174,970	[6] 98	83,145		165,178		713,245		977,777	
Hongkong			49,511	39,837	60,265	41,277	[7] 27,728	[7] 17,655		
Italy [8]	1,194	804	58,423	36	57,859	48	97,271	43	194,522	283
Japan		10,675	24,543	1,532	32,147	401	23,434	2,976	26,036	364
Netherlands	122,862	32,863	117,386	4,698	148,528	4,877	229,544	2,005	235,275	3,278
Philippine Islands	2,264		3,154		3,058		2,808		2,429	
Poland					[1] 6,078		5,439	3	369	
Sweden	[2, 4] 20		4,071	([3])	2,554	([3])	10,065		11,934	1
Tunis	[2] 1,459		[1] 3,248		3,369		3,836		4,577	
Union of South Africa	3,164	7	2,192	5	1,264	29	662	154	401	78
United Kingdom			224,548		226,216		335,004		252,187	
United States	20,988	6,804	76,484	4,806	88,915	3,127	120,158	3,489	67,874	4,232
Total, 33 countries	1,722,142	1,779,845	2,154,684	2,211,084	2,263,701	2,417,288	3,231,018	3,138,760	3,487,389	3,221,961

Bureau of Agricultural Economics. Official sources except where otherwise noted. Includes shelled and unshelled, assuming the peanuts to be unshelled unless otherwise stated. When shelled nuts were reported, they have been reduced to terms of unshelled at the ratio of 3 pounds unshelled to 2 pounds shelled.

[1] International Yearbook of Agricultural Statistics. [2] 2-year average. [3] Less than 500 pounds.
[4] International Institute of Agriculture, Oleaginous Products and Vegetable Oils. [5] 3-year average. [6] 1 year only. [7] 6 months. [8] Reports include some sesamum.

TABLE 297.—*Peanut oil: International trade, average 1909–1913, annual 1923–1926*

Country	Year ended Dec. 31									
	Average, 1909–1913 [1]		1923		1924		1925		1926, preliminary	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
PRINCIPAL EXPORTING COUNTRIES	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
China	(2)	[3] 35, 593	(2)	62, 285	(2)	89, 636	(2)	78, 408	--------	109, 697
France	142	50, 967	1, 230	59, 332	3, 154	66, 384	3, 510	53, 744	10, 788	73, 152
Netherlands	2, 743	18, 569	6, 960	20, 170	19, 134	24, 281	40, 209	26, 336	59, 916	26, 892
United Kingdom	(2)	(2)	7, 170	11, 921	10, 980	21, 784	25, 148	25, 431	29, 678	22, 100
PRINCIPAL IMPORTING COUNTRIES										
Algeria	(2)	(2)	29, 510	646	30, 248	539	23, 542	460	[4] 21, 802	[4] 402
Belgium	2, 233	2, 065	3, 642	4, 978	3, 678	4, 917	9, 187	5, 030	6, 779	4, 878
Canada	--------	--------	[5] 17, 708	--------	26, 424	--------	16, 134	--------	38, 794	--------
Czechoslovakia	--------	--------	93	3	[4] 959	--------	1, 512	(6)	1, 437	55
Denmark	2, 941	[3] 156	1, 517	1, 309	828	2, 019	1, 889	1, 743	1, 086	1, 829
Dutch East Indies	[7] 2, 090	[7] 45	[4] 1, 533	[4] 57	1, 518	192	1, 315	1, 648	[4] 105	831
Germany	1, 602	--------	7, 137	7, 363	13, 792	6, 141	23, 016	20, 551	4, 109	24, 217
Hong Kong	--------	--------	33, 911	24, 942	41, 142	27, 691	[8] 20, 245	[8] 12, 984	--------	--------
Italy	8, 867	[3] 4	1, 347	29	8, 605	3	9, 074	105	14, 936	106
Morocco	(2)	--------	2, 983	--------	2, 448	--------	1, 894	--------	1, 615	--------
Norway	(2)	(2)	10, 727	903	7, 261	--------	8, 433	--------	8, 104	--------
Philippine Islands	[3] 976	(2)	3, 011	(2)	3, 754	(2)	3, 286	--------	4, 030	--------
Sweden	2, 459	--------	5, 985	534	6, 251	333	6, 755	667	8, 178	1, 141
United States	[9] 7, 295	(2)	8, 009	203	15, 395	39	3, 027	--------	8, 281	--------
Yugoslavia	[3] 273	--------	[4] 217	--------	[4] 257	--------	[4] 3, 594	--------	[10] 7, 290	--------
Total 19 countries	31, 621	107, 399	142, 690	194, 675	195, 828	243, 959	201, 770	227, 107	226, 928	265, 300

Bureau of Agricultural Economics. Official sources except where otherwise noted. Conversions made on the basis of 7.5 pounds to the gallon.

[1] International Institute of Agriculture, Oleaginous Products and Vegetable Oils.
[2] Not separately stated.
[3] 4-year average.
[4] International Yearbook of Agricultural Statistics.
[5] Includes some soy-bean oil.
[6] Less than 500.
[7] 2-year average.
[8] 6 months.
[9] 3-year average.
[10] Includes some sesamum oil.

TABLE 298.—*Peanut oil: refined: Average price per pound (in barrels), at New York, 1916–1927*

Year beginning September	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Average
Average:	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1921–1925	14. 09	14. 25	14. 29	14. 30	14. 93	15. 15	15. 52	15. 68	15. 13	15. 05	14. 95	15. 04	14. 86
1916	12. 19	12. 60	13. 33	13. 49	13. 50	14. 38	14. 80	17. 58	17. 83	17. 87	17. 44	18. 05	15. 26
1917	18. 61	20. 12	21. 67	22. 67	22. 49	22. 98	22. 33	22. 41	21. 70	21. 15	21. 47	21. 78	21. 62
1918	21. 44	22. 75	22. 75	21. 06	20. 36	20. 25	19. 90	22. 38	24. 58	26. 91	29. 31	30. 05	23. 48
1919	26. 25	25. 25	26. 68	26. 69	27. 50	20. 43	27. 12	25. 00	23. 10	20. 88	19. 00	17. 19	24. 26
1920	16. 88	16. 20	14. 62	12. 75	12. 52	12. 34	11. 00	10. 70	10. 50	10. 25	10. 00	10. 12	12. 32
1921	10. 62	11. 75	11. 59	11. 22	11. 25	11. 38	12. 25	13. 15	13. 00	13. 00	12. 48	12. 62	12. 03
1922	12. 40	12. 25	13. 03	14. 25	16. 83	17. 38	17. 85	17. 75	16. 56	16. 00	16. 00	16. 00	15. 53
1923	16. 00	16. 00	15. 59	14. 80	14. 75	14. 75	14. 75	14. 75	14. 88	15. 25	15. 25	15. 56	15. 19
1924	16. 45	16. 25	16. 25	16. 25	16. 75	16. 75	16. 75	16. 75	15. 20	15. 00	15. 00	15. 00	16. 03
1925	15. 00	15. 00	15. 00	15. 00	15. 00	15. 50	16. 00	16. 00	16. 00	16. 00	16. 00	16. 00	15. 54
1926	16. 00	16. 00	15. 50	14. 62	14. 50	14. 50	14. 50	14. 50	14. 50	14. 50	14. 50	14. 50	14. 84
1927	14. 50	14. 50	14. 30	13. 50	------	------	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Compiled from Oil, Paint, and Drug Reporter, average of weekly range.

TABLE 299.—*Sugar beets: Production by States, 1925–1927*

State and year [1]	Acreage [2]			Quantity harvested	Yield per acre	Price per ton received by producers	Value
	Planted	Harvested					
		Area	Percentage of planted				
Ohio:	*Acres*	*Acres*	*Per cent*	*Short tons*	*Short tons*	*Dollars*	*Dollars*
1925	50,000	43,000	86.00	427,000	9.9	6.90	2,945,000
1926	37,000	35,000	94.59	340,000	9.7	7.00	2,383,000
1927 [3]	38,000	37,000	97.37	327,000	8.8		
Michigan:							
1925	118,000	99,000	83.90	969,000	9.8	7.05	6,833,000
1926	110,000	100,000	90.91	793,000	7.9	7.00	5,552,000
1927 [3]	109,000	99,000	90.83	688,000	6.9		
Wisconsin:							
1925	20,000	15,000	75.00	168,000	11.2	7.25	1,218,000
1926	18,000	17,000	94.44	158,000	9.3	7.24	1,141,000
1927 [3]	14,000	13,000	92.86	88,000	6.8		
Nebraska:							
1925	60,000	60,000	100.00	933,000	15.6	5.97	5,574,000
1926	81,000	79,000	97.53	923,000	11.7	7.89	7,274,000
1927 [3]	83,000	82,000	98.80	1,048,000	12.8		
Montana and Wyoming:							
1925	66,000	59,000	89.39	673,000	11.4	6.26	4,213,000
1926	76,000	68,000	89.47	736,000	10.8	7.55	5,557,000
1927 [3]	71,000	68,000	95.77	788,000	11.6		
Idaho:							
1925	42,000	36,000	85.71	456,000	12.7	6.24	2,846,000
1926	25,000	18,000	72.00	108,000	6.0	6.91	744,000
1927 [3]	32,000	30,000	93.75	383,000	12.8		
Colorado:							
1925	181,000	130,000	71.82	1,640,000	12.6	5.98	9,815,000
1926	213,000	211,000	99.06	2,912,000	13.8	7.92	23,050,000
1927 [3]	219,000	218,000	99.54	2,754,000	12.6		
Utah:							
1925	72,000	69,000	95.83	1,064,000	15.4	6.03	6,416,000
1926	74,000	51,000	68.92	415,000	8.1	6.97	2,804,000
1927 [3]	60,000	56,000	93.33	678,000	12.1		
California:							
1925	100,000	76,000	76.00	488,000	6.4	8.21	4,005,000
1926	53,000	46,000	86.79	369,000	9.0	9.25	3,411,000
1927 [3]	60,000	56,000	93.33	449,000	8.0		
Other States:							
1925	68,000	60,000	88.24	548,000	9.1	5.83	3,194,000
1926	58,000	52,000	89.66	469,000	9.0	6.31	2,958,000
1927 [3]	68,000	63,000	92.65	531,000	8.4		
United States:							
1925	777,000	647,000	83.27	7,366,000	11.4	6.39	47,059,000
1926	745,000	677,000	90.87	7,223,000	10.7	7.61	54,964,000
1927 [3]	754,000	722,000	95.76	7,734,000	10.7		
Canada, for United States factories:							
1925	6,000	6,000	100.00	57,000	9.5		
1926	7,000	10,000	142.86	77,000	7.7		
1927 [3]	10,000	9,000	90.00	71,000	7.9		

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

[1] Acreage and production of beets are credited to the State in which actually grown. Year shown is that in which beets were grown. Sugar-making campaign extends into succeeding year.
[2] The planted acreage is that covered by factory contracts, agreements, and understandings, all of which is not actually planted by growers. Therefore abandonment may not mean actual loss of acreage.
[3] Preliminary.

TABLE 300.—*Beet sugar: Production by States, 1925–1927, United States, 1911–1927*

State and year [1]	Factories operating	Average length of campaign	Sugar produced (chiefly refined)	Beets sliced	Beets paid for by factories	Acreage from which beets were harvested	Analysis of beets: Purity coefficient [2]	Analysis of beets: Percentage of sucrose [3]	Recovery of sucrose [4]: Sliced	Recovery of sucrose [4]: Paid for
	No.	*Days*	*Short tons*	*Short tons*	*Short tons*	*Acres*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Ohio:										
1925	5	75	34,000	337,000	376,000	37,000	80.71	13.06	10.09	9.04
1926	5	58	26,000	270,000	286,000	29,000	80.00	12.59	9.63	9.09
1927 [5]	-----	-----	35,000	-----	258,000	29,000	-----	16.67	-----	13.57
Michigan:										
1925	16	65	122,000	1,005,000	1,122,000	115,000	82.79	13.33	12.14	10.87
1926	15	56	106,000	860,000	953,000	118,000	85.58	15.23	12.33	11.12
1927 [5]	-----	-----	104,000	-----	808,000	115,000	-----	16.34	-----	12.87
Wisconsin:										
1925	4	50	13,000	117,000	129,000	12,000	84.62	14.53	11.11	10.08
1926	3	57	12,000	107,000	116,000	13,000	85.05	14.02	11.21	10.34
1927 [5]	-----	-----	13,000	-----	103,000	14,000	-----	15.53	-----	12.62
Nebraska:										
1925	5	115	110,000	876,000	934,000	59,000	82.76	14.38	12.56	11.78
1926	6	93	104,000	898,000	966,000	83,000	83.07	13.14	11.58	10.77
1927 [5]	-----	-----	134,000	-----	1,085,000	85,000	-----	15.02	-----	12.35
Montana and Wyoming:										
1925	6	83	79,000	604,000	627,000	56,000	84.93	15.23	13.08	12.60
1926	7	65	84,000	638,000	724,000	67,000	83.86	14.73	13.17	11.60
1927 [5]	-----	-----	112,000	-----	744,000	65,000	-----	17.20	-----	15.05
Idaho:										
1925	7	62	72,000	470,000	486,000	38,000	87.02	17.02	15.32	14.81
1926	3	32	19,000	129,000	138,000	21,000	87.60	16.28	14.73	13.77
1927 [5]	-----	-----	57,000	-----	395,000	31,000	-----	17.47	-----	14.43
Colorado:										
1925	16	70	211,000	1,642,000	1,717,000	136,000	82.70	14.25	12.85	12.29
1926	17	101	377,000	2,765,000	2,944,000	214,000	84.34	15.05	13.63	12.81
1927 [5]	-----	-----	373,000	-----	2,780,000	220,000	-----	15.25	-----	13.42
Utah:										
1925	15	67	135,000	990,000	1,034,000	67,000	84.20	15.86	13.64	13.06
1926	10	41	53,000	356,000	383,000	48,000	85.96	16.29	14.89	13.84
1927 [5]	-----	-----	91,000	-----	661,000	55,000	-----	16.79	-----	13.77
California:										
1925	7	77	88,000	486,000	490,000	76,000	83.30	19.14	18.11	17.96
1926	5	69	68,000	363,000	369,000	46,000	83.20	19.28	18.73	18.43
1927 [5]	-----	-----	76,000	-----	445,000	55,000	-----	18.88	-----	17.08
Other States:										
1925	7	62	49,000	466,000	508,000	57,000	78.97	13.30	10.52	9.65
1926	7	55	48,000	396,000	421,000	48,000	81.31	14.14	12.12	11.40
1927 [5]	-----	-----	67,000	-----	526,000	62,000	-----	14.64	-----	12.74
United States:										
1911	66	94	600,000	5,062,000	-----	474,000	82.21	15.89	11.84	-----
1912	73	86	693,000	5,224,000	-----	555,000	84.49	16.31	13.26	-----
1913	71	85	733,000	5,659,000	5,886,000	580,000	83.22	15.78	12.96	12.45
1914	60	85	722,000	5,288,000	5,585,000	483,000	83.89	16.38	13.65	12.93
1915	67	92	874,000	6,150,000	6,511,000	611,000	84.38	16.49	14.21	13.42
1916	74	80	821,000	5,920,000	6,228,000	665,000	84.74	16.30	13.86	13.18
1917	91	74	765,000	5,626,000	5,980,000	665,000	83.89	16.28	13.60	12.79
1918	89	81	761,000	5,578,000	5,949,000	594,000	84.70	16.18	13.64	12.79
1919	89	78	726,000	5,888,000	6,421,000	692,000	82.84	14.48	12.34	11.31
1920	97	91	1,089,000	7,991,000	8,538,000	872,000	83.96	15.99	13.63	12.75
1921	92	76	1,020,000	7,414,000	7,782,000	815,000	83.09	15.77	13.76	13.11
1922	81	58	675,000	4,963,000	5,183,000	530,000	83.76	15.44	13.61	13.02
1923	89	70	881,000	6,585,000	7,006,000	657,000	83.43	15.30	13.37	12.57
1924	90	66	1,090,000	7,075,000	7,513,000	817,000	85.03	17.19	15.41	14.51
1925	88	71	913,000	6,993,000	7,423,000	653,000	82.84	14.86	13.06	12.30
1926	78	67	897,000	6,782,000	7,300,000	687,000	84.03	14.94	13.23	12.29
1927 [5]	-----	-----	1,062,000	-----	7,805,000	731,000	-----	15.98	-----	13.61

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

[1] Acreage and production of beets are credited to the States in which the beets are made into sugar. Year shown is that in which beets were grown. Sugar-making campaign extends into succeeding year.
[2] Percentage of sucrose (pure sugar) in the total soluble solids of the beets.
[3] Based upon weight of beets sliced, except possibly in a very few factories.
[4] Sucrose actually extracted by factories (as percentage of weight of beets).
[5] Preliminary.

TABLE 301.—*Cane sugar: Production in Louisiana, 1911–1927*

Year [1]	Factories in operation	Sugar production		Average sugar made per ton of cane	Cane used for sugar			Molasses made [3]	
		As made	Equivalent refined [2]		Acreage	Average per acre	Production	Total	Per ton of sugar
	No.	*Short tons*	*Short tons*	*Pounds*	*Acres*	*Short tons*	*Short tons*	*Gallons*	*Gallons*
1911	188	352, 874	328, 879	120	310, 000	19	5, 887, 292	35, 062, 525	99
1912	126	153, 573	143, 130	142	197, 000	11	2, 162, 574	14, 302, 169	93
1913	153	292, 698	272, 795	139	218, 000	17	4, 214, 000	24, 046, 320	82
1914	149	242, 700	226, 200	152	213, 000	15	3, 199, 000	17, 177, 443	71
1915	136	137, 500	128, 200	135	183, 000	11	2, 018, 000	12, 743, 000	93
1916	150	303, 900	283, 200	149	221, 000	18	4, 072, 000	26, 154, 000	86
1917	140	243, 600	227, 000	128	244, 000	15. 6	3, 813, 000	30, 728, 000	126
1918	134	280, 900	261, 800	135	231, 200	18	4, 170, 000	28, 049, 000	100
1919	121	121, 000	112, 800	129	179, 900	10. 5	1, 883, 000	12, 991, 000	107
1920	122	169, 127	157, 626	136	182, 843	13. 6	2. 492, 524	16, 856, 867	100
1921	124	324, 431	302, 370	155	226, 366	18. 5	4, 180, 780	25, 423, 341	78
1922	112	295, 095	275, 029	156	241, 433	15. 6	3, 778, 110	22, 718, 640	77
1923	105	162, 023	151, 005	136	217, 259	11. 1	2, 386, 650	15, 719, 400	97
1924	82	88, 000	82, 000	144	163, 000	7. 6	1, 228, 000	9, 500, 000	109
1925	91	139, 000	130, 000	105	190, 000	14. 0	2, 645, 000	17, 783, 000	128
1926	54	47, 000	44, 000	109	128, 000	6. 8	864, 000	6, 614, 000	141
1927 [4]		78, 000	73, 000	139	80, 000	14. 0	1, 120, 000	7, 963, 000	102

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

[1] Sugar campaign, usually not ended before February following season of growth of cane.
[2] One ton of sugar as made is assumed to be equivalent to 0.932 ton of refined as tentatively recommended by the joint committee on sugar statistics of the Department of Commerce and the Department of Agriculture.
[3] Figures for molasses, 1911–1914, are as reported by the Louisiana Sugar Planters' Association; figures for later years as reported by Division of Crop and Livestock Estimates.
[4] Preliminary.

TABLE 302.—*Cane sugar: Production of Hawaii, 1914–1927*

Year	Average length of campaign	Sugar production		Cane used for sugar			Total area in cane	Average extraction of sugar	
		As made	Equivalent refined [1]	Area harvested	Average yield per acre	Production		Per centage of cane	Per short ton of cane
	Days	*Short tons*	*Short tons*	*Acres*	*Short tons*	*Short tons*	*Acres*	*Per cent*	*Pounds*
1914	183	612, 000	573, 000	112, 700	43	4, 900, 000		12. 49	250
1915	195	646, 000	605, 000	113, 200	46	5, 185, 000	239, 800	12. 46	249
1916	180	592, 763	554, 708	115, 419	42	4, 859, 424	246, 332	12. 20	244
1917	190	644, 663	603, 276	123, 900	42	5, 220, 000	245, 100	12. 35	247
1918	184	576, 700	539, 676	119, 800	41	4, 855, 000	276, 800	11. 88	238
1919	178	600, 312	561, 772	119, 700	40	4, 744, 000	239, 900	12. 65	253
1920	175	555, 727	520, 049	114, 100	39	4, 473, 000	247, 900	12. 42	248
1921	202	521, 579	488, 094	113, 100	41	4, 657, 000	236, 500	11. 20	224
1922	199	592, 000	554, 000	124, 000	41	5, 088, 000	229, 000	11. 64	233
1923	167	537, 000	503, 000	114, 000	40	4, 560, 000	235, 000	11. 77	235
1924	192	691, 000	647, 000	111, 000	51	5, 661, 000	232, 000	12. 21	244
1925	154	769, 000	720, 000	122, 000	52	6, 297, 000	241, 000	12. 21	244
1926 [2]	180	787, 246	736, 705	122, 309	53	6, 495, 686	237, 774	12. 12	242
1927 [2]		811, 333	759, 245						

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

[1] 1 ton of sugar as made is assumed to be equivalent to 0.9358 tons of refined, as tentatively recommended by the joint committee on sugar statistics of the Department of Commerce and the Department of Agriculture.
[2] Data collected through the Hawaiian Sugar Planters' Association.

TABLE 303.—*Sugar: Production in the United States and its possessions, 1909–1927*

Year beginning July	Beet sugar (chiefly refined)	Cane sugar (chiefly raw)					Total
		Louisiana	Other States	Porto Rico	Hawaii	Philippine Islands [1]	
Average:	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*
1909–1913	609,620	292,478	9,672	363,474	567,495	252,781	2,095,519
1914–1920	822,651	214,104	3,699	452,549	591,106	466,033	2,550,143
1921–1925	915,898	201,883	----------	499,744	675,249	584,894	2,879,009
1909	512,469	320,526	11,200	346,786	517,090	140,783	1,848,854
1910	510,172	342,720	12,320	349,840	566,821	164,658	1,946,531
1911	599,500	352,874	8,000	371,076	595,033	205,046	2,131,534
1912	692,556	153,573	9,000	398,004	546,524	345,077	2,144,734
1913	733,401	292,698	7,840	351,666	612,000	408,339	2,405,944
1914	722,054	242,700	3,920	346,490	646,000	421,192	2,382,356
1915	874,220	137,500	1,120	483,590	592,763	412,274	2,501,467
1916	820,657	303,900	7,000	503,081	644,663	425,266	2,704,567
1917	765,207	243,600	2,240	453,794	576,700	474,745	2,516,286
1918	760,950	280,900	3,500	406,002	600,312	453,346	2,505,010
1919	726,451	121,000	1,125	485,071	555,727	466,912	2,356,286
1920	1,089,021	169,127	6,987	489,818	521,579	608,499	2,885,031
1921	1,020,489	324,431	3,270	408,325	592,000	533,189	2,881,704
1922	675,000	295,095	640	379,172	537,000	475,325	2,362,232
1923	881,000	162,023	2,800	447,570	691,000	529,091	2,713,484
1924	1,090,000	88,483	----------	660,411	769,000	779,510	3,387,404
1925	913,000	139,381	----------	603,240	787,246	607,356	3,050,223
1926	897,000	47,166	----------	627,593	[2] 810,000	----------	----------
1927 [3]	1,060,000	77,840	----------	[2] 668,000	[2] 816,000	----------	----------

Bureau of Agricultural Economics. Cane sugar production 1909-1910 from Willett & Gray; 1911 and subsequently from United States Department of Agriculture. Hawaiian production from Hawaiian Sugar Planters' Association. Figures for earlier years appear in previous issues of the Yearbook.

[1] Exports 1909-1911, production 1912 and subsequently. [2] Unofficial. Preliminary.

TABLE 304.—*Sugar beets: Acreage, yield per acre, and production in specified countries, average 1909–1913, annual 1924–1927*

Country	Acreage					Yield per acre					Production				
	Average, 1909–1913 [1]	1924	1925	1926	1927, preliminary	Average, 1909–1913	1924	1925	1926	1927, preliminary	Average, 1909–1913 [1]	1924	1925	1926	1927, preliminary
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*
Canada	17	36	43	47	44	9.4	9.3	10.7	11.3	9.4	160	334	458	529	413
United States	485	815	647	677	722	10.0	9.2	11.4	10.7	10.7	4,860	7,489	7,366	7,223	7,737
England and Wales	2	22	55	126	222	[2] 7.3	9.2	8.7	9.8	8.6	[2] 29	202	479	1,234	1,904
Scotland	(3)	(4)	1	4	13	(3)	-------	3.0	7.8	-------	(3)	-------	3	31	-------
Irish Free State	(3)	(3)	(3)	10	18	(3)	(3)	(3)	9.6	-------	(3)	(3)	(3)	96	-------
Sweden	78	102	100	11	97	13.3	9.9	15.0	14.3	10.4	1,036	1,008	1,503	157	1,005
Denmark	80	95	93	74	96	10.9	11.2	14.3	14.7	12.2	871	1,063	1,333	1,085	1,168
Netherlands	144	183	163	152	171	13.7	14.6	15.0	15.3	11.9	1,977	2,675	2,451	2,327	2,041
Belgium	146	200	178	158	175	12.3	13.7	13.4	11.7	12.5	1,793	2,744	2,359	1,855	2,180
France	612	503	537	563	545	10.7	12.7	11.0	9.5	11.3	6,543	6,369	5,921	5,357	6,143
Spain	[5] 114	443	282	178	153	[5] 10.2	5.2	7.3	11.3	10.9	949	2,312	2,070	2,009	1,670
Italy	130	306	141	107	230	15.3	13.4	12.3	12.9	11.1	1,983	4,101	1,735	2,532	2,563
Switzerland	[2] 2	3	3	4	4	[2] 18.3	16.7	16.0	14.0	13.8	[6] 26	50	48	56	55
Germany	[7] 1,075	975	996	996	1,073	[7] 13.7	11.6	11.4	11.6	11.2	[7] 14,679	11,317	11,382	11,569	11,964
Austria	57	46	50	49	56	9.8	10.4	10.9	10.8	10.8	561	477	543	530	607
Czechoslovakia	716	748	760	686	710	11.5	12.3	13.2	10.5	11.7	8,238	9,231	10,003	7,221	8,306
Hungary	131	168	163	156	152	11.5	8.4	10.3	10.2	9.3	1,513	1,405	1,634	1,592	1,415
Yugoslavia	35	119	82	86	106	10.9	9.8	6.9	7.6	6.8	381	1,172	563	652	716
Bulgaria	7	64	[8] 1	49	39	8.1	7.0	[8] 5.0	6.8	8.9	57	446	[8] 5	331	348
Rumania	[6] 71	133	159	204	209	[6] 9.3	7.2	6.8	6.9	5.8	[6] 668	963	1,089	1,416	1,204
Poland	431	404	425	457	504	10.7	8.8	9.6	9.0	9.6	4,611	3,539	4,064	4,106	4,829
Latvia	(3)	(4)	(4)	1	2	(3)	(4)	(4)	8.0	6.0	(3)	(4)	(4)	8	12
Finland	(3)	1	3	5	7	(3)	6.0	6.7	7.4	8.7	(3)	6	20	37	61
Russia	1,484	858	1,286	1,334	1,526	7.2	3.7	5.9	5.3	7.2	10,636	3,213	7,618	7,042	10,913
Australia	[6] 1	2	2	2	3	[6] 7.0	13.5	12.0	5.5	-------	[6] 7	27	24	11	-------
Total all countries reporting for all periods listed	5,818	6,226	6,170	6,226	6,877	-------	-------	-------	-------	-------	61,571	60,116	62,724	58,863	67,254
Estimated world total [9]	5,818	6,226	6,170	6,226	6,877	-------	-------	-------	-------	-------	61,578	60,145	62,751	59,006	-------

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture.

[1] Figures for European countries are estimates for present boundaries.
[2] 2-year average.
[3] No sugar beets grown.
[4] Less than 500.
[5] 3-year average.
[6] 4-year average.
[7] 1 year only, 1912. According to statistics of the German Sugar Association, the 1912 sugar-beet acreage and production was greater than any other year with the exception of production in 1913.
[8] No sugar was produced in Bulgaria in 1925. The beets produced were probably shipped to neighboring countries for sugar manufacture or used for other purposes.
[9] Exclusive of acreage and production in minor producing countries for which no data are available.

TABLE 305.—*Sugar: Production in specified countries, average 1909–10 to 1913–14, annual 1924–25 to 1927–28*

BEET SUGAR IN TERMS OF RAW SUGAR

	Average, 1909–10 to 1913–14 [1]	1924–25	1925–26	1926–27	1927–28, preliminary
NORTH AMERICA	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*
Canada [2]	11,782	48,733	41,375	37,706	[3] 34,000
United States [2]	655,000	1,172,000	981,000	964,000	1,140,000
Total North America	666,782	1,220,733	1,022,375	1,001,706	1,174,000
EUROPE					
England and Wales	[4] 3,084	29,745	64,082	186,850	316,522
Scotland	(5)	(5)	163	4,031	14,000
Irish Free State	(5)	(5)	(5)	13,416	23,000
Sweden	153,739	149,116	225,419	[6] 23,119	150,000
Denmark	127,091	149,600	194,225	163,000	165,000
Netherlands [2]	246,341	352,355	330,277	309,386	257,400
Belgium	278,837	434,866	361,034	253,341	370,593
France [2]	807,887	867,562	795,702	769,074	[7] 915,398
Spain	115,727	280,908	266,955	239,888	193,000
Italy [2]	208,675	468,119	168,971	341,390	307,300
Switzerland	3,784	6,614	7,165	6,700	8,000
Germany	[8] 2,340,268	1,723,601	1,763,051	1,832,664	[7] 1,819,000
Austria	79,528	83,161	86,139	87,500	100,000
Czechoslovakia	1,221,274	1,574,494	1,650,148	1,149,984	1,364,000
Hungary	175,783	222,838	183,128	192,998	180,300
Yugoslavia	41,459	140,414	66,818	82,107	94,192
Bulgaria	4,376	44,530	(5)	36,312	41,454
Rumania	[9] 88,245	98,379	114,829	162,600	157,464
Poland [2]	702,626	540,015	638,274	633,546	672,403
Latvia	(5)	(5)	(5)	926	1,587
Finland	(5)	667	2,259	4,013	7,349
Russia	1,557,114	501,977	1,065,315	883,635	1,369,123
Total Europe	8,155,838	7,668,961	7,933,954	7,376,480	8,527,085
OCEANIA					
Australia	1,030	3,379	2,593	1,299	2,000
World total, beet sugar [10]	8,823,650	8,893,073	9,008,922	8,379,485	9,703,085

CANE SUGAR (RAW)

NORTH AMERICA, CENTRAL AMERICA, AND WEST INDIES					
United States	302,150	88,483	139,381	47,166	77,840
Hawaii	567,495	769,000	787,246	[3] 816,000	[3] 816,000
Porto Rico	361,974	660,411	603,240	627,593	673,000
Virgin Islands	9,613	8,047	6,343	7,687	[3] 9,000
Central America:					
Honduras	----------	[3] 24,563	[3] 16,877	[3] 18,750	----------
Guatemala	8,998	26,896	28,169	36,197	[3] 34,000
Nicaragua	3,742	[3] 16,483	[3] 17,500	[3] 27,600	[3] 15,000
Salvador	[11] 10,834	22,000	[3] 20,000	----------	----------
Mexico	163,388	185,297	214,618	203,399	[3] 196,000
West Indies (British):					
Antigua	12,919	[3] 19,400	[3] 14,300	[3] 26,321	[3] 20,000
Barbados	27,788	55,233	53,938	[3] 65,727	[3] 66,000
Jamaica	23,856	[3] 47,984	[3] 62,894	[3] 73,114	[3] 67,000
St. Christopher	13,252	17,431	[3] 18,346	[3] 20,236	[3] 19,000
Trinidad and Tobago	51,275	77,983	82,388	[3] 58,468	[3] 64,000
Cuba	2,287,052	5,812,068	5,523,946	5,049,632	4,480,000
Dominican Republic	[9] 104,664	345,728	394,033	346,386	[3] 336,000

[1] Figures for Europe are estimates for present boundaries.
[2] Refined sugar in terms of raw.
[3] Unofficial estimate.
[4] 2-year average.
[5] No sugar produced.
[6] Production in 1926–27 was curtailed because sugar-beet growers and manufacturers failed to agree on sugar-beet prices.
[7] Sugar association estimate.
[8] 1 year only, 1912–13. According to statistics of the German Sugar Association the 1912–13 sugar production was greater than any other year.
[9] 4-year average.
[10] Exclusive of production in minor producing countries for which no data are available.
[11] 3-year average.

TABLE 305.—*Sugar: Production in specified countries, average 1909–10 to 1913–14, annual 1924–25 to 1927–28*—Continued

CANE SUGAR (RAW)—Continued

	Average, 1909–10 to 1913–14	1924–25	1925–26	1926–27	1927–28, preliminary
NORTH AMERICA, CENTRAL AMERICA, AND WEST INDIES—continued	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*
Haiti	(12)	[3] 9, 274	[3] 11, 249	[3] 14, 071	[3] 17, 000
West Indies (French):					
Guadeloupe	40, 810	43, 000	[3] 36, 958	[3] 39, 954	[3] 35, 000
Martinique	42, 782	53, 044	[3] 53, 896	[3] 50, 444	[3] 50, 000
Total North and Central American countries reporting for all periods listed	4, 021, 758	8, 235, 762	8, 048, 445	7, 509, 995	6, 974, 840
EUROPE AND ASIA					
Spain	17, 059	9, 043	[3] 9, 748	[3] 7, 525	[3] 10, 000
India [13]	2, 649, 480	2, 852, 000	3, 334, 000	3, 593, 000	[3] 3, 600, 000
Formosa	192, 299	528, 597	551, 068	476, 162	557, 000
Japan	75, 718	112, 016	100, 875	[3] 117, 630	[3] 127, 000
Java [14]	1, 512, 569	2, 201, 368	2, 535, 152	2, 174, 585	2, 588, 000
Philippine Islands	294, 380	779, 510	607, 356	(15)	(15)
Total European and Asiatic countries reporting for all periods listed	4, 447, 125	5, 703, 024	6, 530, 843	6, 368, 902	6, 882, 000
SOUTH AMERICA					
Argentina	193, 853	274, 127	433, 968	522, 772	[3] 476, 000
Brazil	[11] 332, 813	916, 543	996, 901	937, 578	[3] 728, 000
British Guiana	[11] 112, 297	101, 780	120, 490	109, 930	[3] 112, 000
Dutch Guiana	13, 235	9, 996	[3] 13, 969	[3] 14, 814	[3] 15, 120
Ecuador	[4] 6, 289	[3] 20, 900	[3] 19, 013	[3] 22, 760	[3] 26, 000
Peru	202, 518	345, 025	[3] 316, 800	[3] 308, 000	[3] 325, 000
Venezuela	3, 187	[3] 23, 100	[3] 23, 880	[3] 21, 000	[3] 26, 300
Total South America	864, 192	1, 691, 471	1, 925, 021	1, 936, 854	1, 708, 420
AFRICA					
Egypt	67, 127	88, 268	105, 620	78, 872	[3] 99, 000
Mauritius	233, 671	247, 698	265, 903	212, 292	237, 000
Union of South Africa	88, 165	161, 253	239, 851	[3] 242, 662	[3] 240, 000
Portuguese East Africa	26, 460	[3] 49, 591	[3] 44, 000	[3] 61, 000	[3] 66, 000
Reunion	41, 653	57, 904	57, 000	62, 400	[3] 44, 000
Madagascar	(12)	3, 296	3, 970	[3] 3, 527	[3] 3, 858
Total Africa	457, 076	608, 010	716, 344	660, 753	689, 858
OCEANIA					
Australia	216, 331	478, 606	580, 126	464, 623	[3] 567, 000
Fiji	84, 629	71, 477	113, 000	[3] 95, 000	[3] 106, 000
Total Oceania	300, 960	550, 083	693, 126	559, 623	673, 000
Total cane sugar producing countries reporting for all periods listed	10, 091, 111	16, 788, 350	17, 913, 779	17, 036, 127	16, 928, 118
Estimated world total cane sugar [10]	10, 544, 000	17, 778, 000	18, 723, 000	17, 947, 000	17, 849, 000
Total world cane and beet sugar production in countries reporting all periods listed	18, 914, 761	25, 681, 423	26, 922, 701	25, 415, 612	26, 651, 203
Estimated world total beet and cane sugar [10]	19, 368, 000	26, 671, 000	27, 732, 000	26, 326, 000	27, 552, 000

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture except as otherwise stated. Figures are for the crop years 1909–10 to 1927–28 for the countries in which the sugar harvesting season begins in the fall months and is completed during the following calendar years, except in certain cane-sugar producing countries where the season begins in May or June and is completed in the same calendar year. Production in these countries is for the calendar years 1909 to 1927.

[3] Unofficial estimate.
[4] 2-year average.
[10] Exclusive of production in minor producing countries for which do data are available.
[11] 3-year average.
[12] Too small to report.
[13] The figures quoted for India are the production of gur, a low grade of sugar polarizing at between 50° and 60°. This sugar is mostly consumed by the natives.
[14] All grades of sugar reduced to terms of head sugar, a grade of sugar which contains at least 96.5 per cent sucrose.
[15] Figures for the total crop are not yet available. Trade reports place the 1926–27 commercial crop at 654,000 short tons and that of 1927–28 at 672,000 short tons.

TABLE 306.—*Sugar: Production, trade, and supply available for consumption in continental United States, 1909–1927*

IN TERMS OF RAW SUGAR

Year beginning July 1	Production [1]	Brought in from insular possessions [2]	Imports as sugar [3]	Domestic exports as sugar [4]	Exports in other forms [5]	Available for consumption [6]	
						Total	Per capita
	Short tons	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Pounds*
Average:							
1909–1913	957, 491	1, 004, 493	2, 068, 427	45, 502	17, 317	3, 967, 591	84. 0
1914–1920	1, 102, 153	1, 072, 288	2, 847, 575	547, 406	46, 538	4, 428, 072	86. 0
1921–1925	1, 187, 693	1, 495, 517	3, 854, 633	441, 588			
1909	882, 630	927, 752	1, 934, 754	72, 352	24, 351	3, 648, 403	79. 7
1910	903, 475	943, 701	1, 845, 279	36, 597	15, 966	3, 639, 891	78. 3
1911	1, 005, 337	1, 187, 663	1, 832, 424	50, 380	15, 160	3, 959, 883	83. 9
1912	907, 070	1, 026, 972	2, 266, 426	30, 963	19, 217	4, 150, 288	86. 6
1913	1, 088, 844	936, 376	2, 463, 252	37, 190	11, 892	4, 439, 489	91. 3
1914	1, 022, 828	1, 098, 314	2, 529, 963	302, 641	13, 585	4, 334, 878	87. 9
1915	1, 078, 407	1, 102, 057	2, 689, 067	882, 864	12, 213	3, 974, 453	79. 4
1916	1, 193, 107	1, 203, 938	2, 527, 984	676, 752	29, 211	4, 219, 066	83. 2
1917	1, 068, 437	975, 684	2, 344, 816	305, 429	46, 131	4, 037, 377	78. 5
1918	1, 102, 421	1, 073, 944	2, 799, 962	568, 566	36, 747	4, 371, 013	83. 8
1919	903, 060	975, 735	3, 812, 955	776, 502	98, 386	4, 816, 862	91. 1
1920	1, 346, 811	1, 076, 342	3, 228, 279	319, 589	89, 491	5, 242, 852	97. 6
1921	1, 424, 726	1, 340, 867	3, 940, 777	1, 085, 349	31, 397	5, 589, 624	102. 4
1922	1, 021, 360	1, 235, 049	4, 068, 205	412, 196	12, 568	5, 899, 849	106. 5
1923	1, 111, 898	1, 274, 870	3, 436, 955	152, 883	24, 617	5, 646, 223	100. 2
1924	1, 260, 000	1, 645, 319	3, 931, 282	273, 470	22, 436	6, 540, 695	114. 2
1925	1, 121, 000	1, 981, 482	3, 895, 947	325, 804	24, 998	6, 647, 627	114. 4
1926	1, 011, 000	1, 689, 347	3, 968, 880	447, 055	(7)		
1927	1, 217, 000						

IN TERMS OF REFINED SUGAR [8]

1921	1, 325, 906	1, 260, 894	3, 686, 397	1, 009, 377	29, 182	5, 234, 638	95. 9
1922	950, 625	1, 161, 351	3, 805, 745	383, 439	11, 682	5, 522, 600	99. 7
1923	1, 034, 615	1, 193, 777	3, 214, 883	142, 217	22, 943	5, 283, 115	93. 7
1924	1, 172, 000	1, 547, 587	3, 674, 563	254, 391	20, 911	6, 118, 848	106. 8
1925	1, 043, 000	1, 859, 332	3, 634, 323	303, 073	23, 298	6, 210, 284	106. 8
1926	941, 000	1, 588, 981	3, 714, 054	415, 865	(7)		
1927	1, 133, 000						

Bureau of Agricultural Economics. Trade figures, Bureau of Foreign and Domestic Commerce.

[1] Beet and cane sugar only.
[2] Duty free, from Hawaii, Porto Rico, and the Philippine Islands (Virgin Islands included 1917 and subsequently).
[3] No account taken of sugar imported in other forms. Imports from the Philippine Islands excluded, reexports deducted.
[4] Shipments to Hawaii and Porto Rico included. Direct exports to foreign countries from Hawaii and Porto Rico excluded.
[5] Sugar used in the manufacture of other commodities for export on which drawback was paid.
[6] No account taken of stocks at the beginning or end of year.
[7] Not available.
[8] Raw sugar converted to refined by multiplying by the following factors: Cuba and Hawaii, 0.9358; Porto Rico, 0.9393; Philippines, 0.95; All others (Santo Domingo, British West Indies, Louisiana, etc.), 0.932.

TABLE 307.—*Sugar: International trade, average 1909–1913, annual 1924–1926*

Country	Year ended Dec. 31							
	Average 1909–1913		1924		1925		1926, preliminary	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
PRINCIPAL EXPORTING COUNTRIES	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*
Australia	76,233	268	[1] 3,412	[1] 89,893	[2] 381	[2] 178,186	[2] 4,059	[2] 89,604
Belgium	7,892	154,476	65,712	177,693	66,925	231,094	56,978	176,540
British Guiana	[3] 6,112	106,196	309	96,204	436	109,455	440	94,819
Cuba	656	2,009,899	8,923	4,379,275	-----	[4] 5,530,836	-----	[4] 5,225,414
Czechoslovakia	-----	-----	35	734,938	-----	912,498	69	1,019,467
Dominican Republic	[5] 766	92,351	501	243,227	578	331,974	191	372,195
Dutch East Indies	3,562	1,412,555	3,631	2,070,679	[6] 178	[6] 2,279,156	[2] [6] 246	[2] 1,915,135
Fiji	[7] 386	78,817	133	49,809	121	102,753	136	1,276,598
Formosa	554	5,744	20,167	27,702	23,518	27,458	[2] 34,414	[2] 520,610
Germany	3,486	873,161	50,412	418,477	125,202	125,868	47,668	197,724
Hong Kong	-----	-----	418,337	336,631	[8] 103,779	[8] 148,966	-----	-----
Hungary	-----	-----	887	106,066	163	93,376	138	72,986
Jamaica	395	14,494	-----	38,776	[2] 1,059	[2] 42,241	[2] 750	[2] 53,932
Mauritius	[3] 2	226,255	1	201,437	([9])	211,976	[2] 3	[2] 220,460
Netherlands	82,721	200,490	258,223	293,091	363,750	417,007	434,019	348,656
Peru	726	146,736	277	292,671	350	229,432	22	363,515
Philippine Islands	3,950	179,432	3,741	394,436	1,103	602,773	-----	453,300
Poland	-----	-----	123	271,498	206	216,085	61	293,973
Reunion	[7] 2	41,658	-----	47,458	-----	[2] 49,978	-----	[2] 69,790
Russia	3,744	293,514	[2] [10] 25,008	[2] [10] 16,991	[2] [10] 249,827	[2] [10] 17,792	[2] [10] 41,883	[2] [10] 50,129
Trinidad and Tobago	522	43,755	945	48,632	1,129	67,930	1,408	73,560
Union of South Africa	29,694	675	537	9,375	5,946	59,970	4,654	65,289
PRINCIPAL IMPORTING COUNTRIES								
Algeria	37,908	-----	47,520	5	54,608	5	53,860	-----
Anglo-Egyptian Sudan	13,764	-----	14,939	-----	15,129	-----	24,631	-----
Argentina	51,690	72	7,329	112	80,744	115	[2] 1,370	[2] 162
Austria	[11] 3,942	[11] 848,830	112,731	372	106,113	1,013	114,124	636
British India	715,990	26,611	624,650	23,011	[12] 841,497	[13] 27,332	[13] 875,927	41,087
British Malaya	([14])	([14])	102,131	39,979	126,488	42,458	121,968	31,288
Canada	297,893	820	435,482	43,550	594,397	155,161	580,306	144,938
Chile	84,965	90	88,752	229	121,401	-----	135,962	-----
China	343,622	14,933	618,019	10,005	795,323	4,789	778,451	819
Denmark	21,814	22,536	57,610	519	27,628	1,490	23,928	260
Egypt	43,020	8,086	48,797	31,095	91,462	18,708	61,973	8,670
Finland	50,077	-----	74,279	-----	122,397	-----	37,469	-----
France	186,198	206,897	519,085	160,966	374,765	194,971	485,662	214,087
Greece	11,718	-----	62,289	-----	[2] 67,292	-----	[2] 60,626	-----
Irish Free State	-----	-----	86,466	-----	98,408	-----	101,805	-----
Italy	9,249	302	50,662	27,201	100,571	10,752	22,797	8,058
Japan	176,942	60,204	339,519	127,274	423,478	163,342	504,588	204,206
Morocco	61,402	-----	83,151	-----	110,558	-----	[2] 106,415	-----
New Zealand	62,962	[3] 13,478	70,920	372	78,229	411	91,223	713
Norway	52,326	-----	83,837	-----	73,016	-----	81,786	-----
Persia	109,352	[3] 557	74,496	68	70,582	355	-----	-----
Portugal	39,631	-----	62,155	[2] 58	[2] 86,968	[2] 129	-----	-----
Sweden	1,672	1	81,693	1	48,987	1	117,070	-----
Switzerland	118,201	-----	137,037	68	142,230	63	142,015	66
United Kingdom	1,853,605	32,603	1,946,416	81,121	2,365,653	73,832	1,976,309	87,180
United States	2,122,517	39,684	4,137,873	220,248	4,459,766	379,358	4,710,099	106,893
Total 48 countries	6,691,863	7,156,180	10,829,152	11,111,213	12,422,441	13,061,089	11,837.503	13,802,759

Bureau of Agricultural Economics. Official sources except where otherwise noted.

The following kinds and grades have been included under the head of sugar: Brown, white candied, caramel, chancaca (Peru), crystal cube, maple, muscovado, panela. The following have been excluded: Candy (meaning confectionery), confectionery, glucose, grape sugar, jaggery, molasses, and sirups.

[1] Year beginning July 1.
[2] International Yearbook of Agricultural Statistics.
[3] 4-year average.
[4] Commercial source.
[5] 1 year only.
[6] Java and Madura only.
[7] 3-year average.
[8] 6 months.
[9] Less than half a ton.
[10] Fiscal year, Oct. 1–Sept. 30.
[11] Average for Austria-Hungary.
[12] Sea trade only.
[13] Includes 9 months, land trade.
[14] Not available.

TABLE 308.—*Sugar, raw, cane and beet: World production, 1909–10 to 1927–28*

Year [1]	Estimated world total	Total European beet sugar	Chief producing countries				
			Cuba	India [2]	Java [3]	Germany [4]	Czecho-slovakia
	Short tons	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*
1909–10	16,831,000	6,598,712	2,020,871	2,480,700	1,368,755	2,146,817	----------
1910–11	18,828,000	8,407,415	1,661,465	2,587,100	1,411,275	2,770,000	----------
1911–12	17,904,000	6,628,923	2,123,502	2,744,900	1,616,599	1,551,797	----------
1912–13	20,367,000	8,884,675	2,719,961	2,861,500	1,550,274	2,901,564	----------
1913–14	21,005,000	8,709,590	2,709,460	2,573,200	1,615,944	2,885,752	----------
1914–15	20,878,000	8,128,018	2,921,984	2,736,000	1,548,668	2,720,635	----------
1915–16	18,874,000	5,644,337	3,398,385	2,949,000	1,454,030	1,678,402	----------
1916–17	18,593,000	4,443,528	3,421,597	3,093,000	1,796,558	1,721,250	----------
1917–18	20,293,000	4,664,962	3,889,966	3,839,000	2,003,521	1,726,483	----------
1918–19	18,791,000	3,867,311	4,490,902	2,752,000	1,960,118	1,297,050	[5] 714,490
1919–20	17,999,000	2,856,507	4,183,676	3,404,000	1,472,796	773,700	552,713
1920–21	19,563,000	4,115,784	4,406,413	2,825,000	1,681,338	1,194,729	796,957
1921–22	20,577,000	4,348,764	4,517,470	2,928,000	1,853,357	1,433,742	730,745
1922–23	20,861,000	4,991,306	4,083,483	3,410,000	1,989,170	1,603,933	811,323
1923–24	22,833,000	5,544,488	4,606,223	3,715,000	1,980,653	1,263,455	1,114,566
1924–25	26,671,000	7,668,961	5,812,068	2,852,000	2,201,368	1,723,601	1,574,494
1925–26	27,732,000	7,983,954	5,523,946	3,334,000	2,535,152	1,763,051	1,650,148
1926–27	26,326,000	7,376,480	5,049,632	3,593,000	2,174,585	1,832,664	1,149,984
1927–28	27,552,000	8,527,085	4,480,000	[6] 3,600,000	2,588,000	[7] 1,819,000	1,364,000

Bureau of Agricultural Economics. Estimated world total sugar production for the period 1895–96 to 1908–1909 in Agriculture Yearbook, 1924, p. 808.

[1] Figures are for the crop years 1909–10 to 1926–27 for the countries in which the sugar harvesting begins in the fall months and is completed during the following calendar year except in the cane-sugar producing countries where the season begins in May or June and is completed in the same calendar year. Production in these countries is for the calendar years 1909 to 1926.

[2] The figures quoted are the production of gur, a low grade of sugar which is mostly consumed by the natives.

[3] All grades of sugar reduced to terms of head sugar.

[4] Figures for 1909–10 to 1917–18 are for pre-war boundaries.

[5] Bohemia, Moravia, and Silesia only.

[6] Unofficial estimate.

[7] Sugar association estimate.

TABLE 309.—*Sugar, raw (96° centrifugal): Average wholesale price per pound, New York, 1909–1927*

Year	Jan.	Feb.	Mar	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Av.[1]
Average:	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1909–1913	3.9	3.9	4.0	3.9	3.9	3.8	4.0	4.2	4.5	4.3	4.2	4.1	4.1
1914–1920	6.2	6.1	6.3	7.3	7.8	7.6	7.4	7.2	6.8	6.4	6.2	6.2	6.8
1921–1925	5.1	5.4	5.8	5.6	5.4	5.1	5.2	5.2	5.3	5.4	5.4	5.2	5.3
1909	3.7	3.6	3.8	3.9	3.9	3.9	3.9	4.1	4.2	4.3	4.4	4.2	4.0
1910	4.1	4.2	4.4	4.3	4.3	4.2	4.3	4.4	4.3	3.9	3.9	4.0	4.2
1911	3.6	3.5	3.8	3.9	3.9	3.9	4.3	4.9	5.9	5.9	5.1	4.8	4.5
1912	4.4	4.6	4.5	4.1	4.0	3.9	3.9	4.1	4.3	4.1	4.0	4.0	4.2
1913	3.5	3.5	3.5	3.4	3.3	3.3	3.6	3.7	3.7	3.5	3.6	3.4	3.5
1914	3.3	3.4	3.0	3.0	3.2	3.3	3.3	5.7	5.8	4.4	3.9	3.9	3.8
1915	4.1	4.7	4.8	4.8	4.8	4.9	4.9	4.8	4.3	4.1	4.8	4.9	4.7
1916	4.6	4.9	5.6	6.2	6.4	6.3	6.3	5.6	5.6	6.3	6.2	5.3	5.8
1917	5.2	5.2	5.5	6.2	6.1	6.0	6.6	7.3	7.0	6.9	6.9	6.3	6.3
1918	6.0	6.0	6.0	6.0	6.0	6.0	6.1	6.1	7.0	7.3	7.3	7.3	6.4
1919	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	10.2	7.5
1920	13.0	11.4	11.9	17.7	20.8	19.7	17.6	13.4	10.7	8.3	6.8	5.3	13.0
1921	5.4	5.3	6.1	5.4	4.9	4.2	4.4	4.7	4.3	4.2	4.1	3.7	4.7
1922	3.6	3.8	3.9	4.0	4.1	4.6	5.2	5.2	4.8	5.4	5.6	5.7	4.7
1923	5.3	6.2	7.3	7.8	7.9	7.4	6.9	6.1	7.0	7.6	7.3	7.3	7.0
1924	6.7	7.2	6.9	6.4	5.6	5.1	5.1	5.4	6.0	6.0	5.8	5.3	6.0
1925	4.6	4.6	4.7	4.5	4.3	4.4	4.3	4.4	4.3	3.9	4.0	4.1	4.3
1926	4.2	4.2	4.0	4.1	4.2	4.1	4.2	4.2	4.4	4.6	4.7	5.1	4.3
1927	5.1	4.9	4.8	4.8	4.8	4.6	4.5	4.5	4.8	4.7	4.7	4.6	4.7

Bureau of Agricultural Economics. Compiled from Bureau of Labor Statistics reports. Data for 1890–1908 are available in 1924 Yearbook, p. 810, Table 388.

[1] Derived from the figures upon which the monthly averages are based.

TABLE 310.—*Sugar, granulated: Average retail price per pound, United States, 1913–1927*

Year	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	July 15	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Average
Average:	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1914–1920	9.1	9.5	9.5	9.9	10.8	10.9	11.0	10.9	10.1	9.6	9.6	9.5	10.0
1921–1925	8.5	8.4	8.9	8.9	8.5	8.3	8.1	8.1	8.1	8.2	8.1	8.1	8.4
1913	5.8	5.5	5.4	5.4	5.4	5.3	5.5	5.6	5.7	5.5	5.4	5.4	5.5
1914	5.2	5.2	5.1	5.0	5.0	5.1	5.2	7.9	8.0	7.2	6.2	6.1	5.9
1915	6.0	6.5	6.6	6.7	6.8	6.9	7.0	6.7	6.5	6.1	6.6	6.8	6.6
1916	6.7	6.9	7.5	8.0	8.6	8.7	8.8	8.5	7.7	8.2	8.6	8.3	8.0
1917	8.0	8.1	8.8	9.6	10.1	9.4	9.2	10.0	9.9	9.8	9.6	9.5	9.3
1918	9.5	10.6	9.2	9.1	9.1	9.1	9.2	9.3	9.6	10.6	10.8	10.8	9.7
1919	10.8	10.7	10.6	10.6	10.6	10.6	10.9	11.1	11.0	11.4	12.5	14.5	11.3
1920	17.8	18.8	18.7	20.2	25.4	26.7	26.5	22.9	18.3	13.9	12.8	10.5	19.4
1921	9.7	8.9	9.7	9.7	8.4	7.8	7.1	7.5	7.3	6.9	6.7	6.5	8.0
1922	6.2	6.4	6.5	6.7	6.6	7.1	7.6	8.1	7.9	7.9	8.1	8.3	7.3
1923	8.3	8.7	10.2	10.6	11.2	11.1	10.5	9.6	9.6	10.6	10.3	10.4	10.1
1924	10.2	10.3	10.4	9.9	9.2	8.3	8.4	8.2	8.6	8.8	8.8	8.8	9.2
1925	8.1	7.7	7.7	7.5	7.2	7.2	7.1	7.0	7.0	6.8	6.6	6.7	7.2
1926	6.7	6.7	6.7	6.6	6.7	6.9	6.9	7.0	7.0	7.1	7.1	7.3	6.9
1927	7.5	7.5	7.4	7.3	7.3	7.3	7.4	7.3	7.2	7.2	7.2	7.1	7.3

Bureau of Agricultural Economics. Compiled from Bureau of Labor Statistics retail prices.

TABLE 311.—*Sorgo sirup: Acreage, production, and December 1 price, by States, 1924–1927*

State	Acreage				Average yield per acre				Production				Price per gallon received by producers Dec. 1			
	1924	1925	1926	1927[1]	1924	1925	1926	1927	1924	1925	1926	1927[1]	1924	1925	1926	1927
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Gals.*	*Gals.*	*Gals.*	*Gals.*	*1,000 gals.*	*1,000 gals.*	*1,000 gals.*	*1,000 gals.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
Ohio	4	4	4	4	75	72	72	76	300	288	288	304	115	125	120	115
Indiana	3	2	2	2	85	88	92	80	255	176	184	160	105	112	105	110
Illinois	9	12	12	10	75	77	78	65	675	924	936	650	112	110	105	110
Wisconsin	2	2	2	2	54	70	66	55	108	140	132	110	120	135	140	135
Minnesota	2	2	2	2	56	71	80	70	112	142	160	140	108	115	120	110
Iowa	5	5	6	10	72	79	77	70	360	395	462	700	110	115	110	115
Missouri	22	22	25	22	81	76	78	79	1,782	1,672	1,950	1,738	99	102	100	100
Nebraska	2	2	2	2	80	70	64	80	160	140	128	160	100	100	100	105
Kansas	4	5	3	2	75	50	58	65	300	250	174	130	98	102	95	100
Virginia	12	11	12	10	95	78	100	92	1,140	858	1,200	920	90	95	95	95
West Virginia	8	8	8	8	92	80	97	89	736	640	776	712	105	115	110	110
North Carolina	31	28	30	27	87	68	91	92	2,697	1,904	2,730	2,484	90	98	90	90
South Carolina	21	20	22	26	62	39	77	71	1,302	780	1,694	1,846	80	92	75	75
Georgia	25	19	23	25	71	45	90	82	1,775	855	2,070	2,050	84	95	70	75
Kentucky	30	39	51	38	80	80	95	81	2,400	3,120	4,845	3,078	97	96	80	85
Tennessee	30	28	32	29	73	68	93	86	2,190	1,904	2,976	2,494	96	94	80	85
Alabama	35	42	36	40	50	70	100	82	1,750	2,940	3,600	3,280	98	90	80	80
Mississippi	36	34	27	30	55	76	100	85	1,980	2,584	2,700	2,550	93	75	70	70
Arkansas	36	38	38	44	58	68	77	80	2,088	2,584	2,926	3,520	93	93	85	85
Louisiana	1	1	1	1	30	75	144	110	30	75	144	110	89	80	70	75
Oklahoma	16	14	14	17	68	76	83	85	1,088	1,064	1,162	1,445	90	93	85	85
Texas	33	31	34	34	50	46	95	95	1,650	1,426	3,230	3,230	92	93	80	80
New Mexico	2	1	1	1	63	65	80	65	126	65	80	65	106	110	100	105
United States	369	370	387	386	67.8	67.4	89.3	82.6	25,004	24,926	34,547	31,876	94.3	94.9	84.2	85.6

Bureau of Agricultural Economics. Estimated by the crop-reporting board.

[1] Preliminary.

TABLE 312.—*Sugar-cane sirup: Acreage, production, and farm price, by States, 1925–1927*

State	Acreage used for sirup			Yield per acre			Production			Price per gallon received by producers Dec. 1.		
	1925	1926	1927 [1]	1925	1926	1927	1925	1926	1927 [1]	1925	1926	1927
	1,000 acres	*1,000 acres*	*1,000 acres*	*Gallons*	*Gallons*	*Gallons*	*1,000 gallons*	*1,000 gallons*	*1,000 gallons*	*Cents*	*Cents*	*Cents*
South Carolina	8	5	7	72	140	140	576	700	980	100	90	90
Georgia	32	35	34	110	175	150	3, 520	6, 125	5, 100	100	75	80
Florida	10	10	9	210	210	183	2, 100	2, 100	1, 647	105	85	85
Alabama	22	20	21	140	165	135	3, 080	3, 300	2, 835	110	90	95
Mississippi	14	14	17	172	205	185	2, 408	2, 870	3, 145	105	95	95
Arkansas	3	3	2	120	135	100	360	405	200	120	105	110
Louisiana	25	34	18	262	133	304	6, 541	4, 516	5, 478	72	60	55
Texas	11	11	12	165	196	170	1, 815	2, 156	2, 040	130	95	110
United States	125	132	120	163	168	179	20, 400	22, 172	21, 425	97	81	82

Bureau of Agricultural Economics. Estimated by the crop-reporting board.

[1] Preliminary.

TABLE 313.—*Maple sugar and sirup: Production in 10 important States, 1917–1927* [1]

Year	Trees tapped	Sugar made	Sirup made	Total product in terms of sugar [2]	Average total product per tree	
					As sugar [2]	As sirup [2]
	Thousand	*Thousand pounds*	*Thousand gallons*	*Thousand pounds*	*Pounds*	*Gallons*
1917	17, 313	10, 525	4, 258	44, 589	2. 58	0. 32
1918	19, 132	12, 944	4, 863	51, 848	2. 71	. 34
1919	18, 799	9, 787	3, 804	40, 219	2. 14	. 27
1920	18, 895	7, 324	3, 580	35, 964	1. 90	. 24
1921	15, 114	4, 730	2, 386	23, 818	1. 58	. 20
1922	16, 274	5, 147	3, 640	34, 267	2. 11	. 26
1923	15, 291	4, 685	3, 605	33, 525	2. 19	. 27
1924	15, 407	4, 078	3, 903	35, 302	2. 20	. 29
1925	15, 313	3, 236	3, 089	27, 946	1. 82	. 23
1926	15, 245	3, 577	3, 900	34, 777	2. 28	. 28
1927 [3]	12, 937	3, 102	3, 183	28, 566	2. 21	. 28

Bureau of Agricultural Economics.

[1] The 10 States (Maine, New Hampshire, Vermont, Massachusetts, New York, Pennsylvania, Ohio, Indiana, Michigan, and Wisconsin) for which data are included from 1924 to 1926 produced 97 per cent of the maple sugar and 97.1 per cent of the maple sirup made in the United States in 1919 as reported by the Bureau of the Census. That bureau also reported 98.1 per cent of the trees tapped in 1919 as being in these States. Data for 11 States including Connecticut are shown from 1917 to 1923.

[2] 1 gallon of sirup taken as equivalent to 8 pounds of sugar.

[3] 8 States, excluding Ohio and Indiana.

TABLE 314.—*Clover seed: Receipts, Chicago, averages 1909–1925, annual 1920–1927*

Year beginning September	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Total
	1,000 lbs.	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
Average:													
1909–1913	622	652	549	426	422	513	677	328	180	320	180	455	5, 325
1914–1920	1, 231	1, 307	1, 323	1, 241	1, 558	1, 690	1, 590	746	221	97	83	355	11, 442
1921–1925	695	1, 209	1, 803	1, 698	1, 357	1, 706	2, 158	964	277	75	52	401	12, 394
1920	1, 207	969	747	1, 004	2, 288	2, 165	4, 062	1, 570	418	164	84	365	15, 043
1921	739	1, 235	2, 040	1, 833	1, 628	2, 674	2, 448	1, 009	279	169	77	997	15, 128
1922	1, 358	1, 293	1, 479	1, 214	1, 044	629	1, 825	845	350	109	8	272	10, 426
1923	641	1, 681	1, 176	1, 039	630	1, 641	2, 054	1, 352	259	41	1	40	10, 555
1924	346	888	2, 195	1, 801	1, 500	1, 507	1, 574	765	9	27	68	328	11, 008
1925	393	946	2, 125	2, 603	1, 984	2, 079	2, 888	849	487	28	107	366	14, 855
1926	1, 107	3, 596	2, 133	1, 350	1, 695	1, 857	1, 671	546	55	------	------	64	14, 074
1927	575	2, 285	4, 689	1, 544	------	------	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Compiled from annual reports of the Chicago Board of Trade.

TABLE 315.—*Clover seed:*[1] *Acreage, production, and December 1 price, by States, 1924–1927*

State	Acreage				Average yield per acre			
	1924	1925	1926	1927 [2]	1924	1925	1926	1927
	Acres	*Acres*	*Acres*	*Acres*	*Bushels*	*Bushels*	*Bushels*	*Bushels*
New York	8,000	7,000	3,000	1,000	2.7	1.7	1.7	1.8
Pennsylvania	17,000	16,000	8,000	14,000	1.5	1.8	1.5	1.6
Ohio	156,000	168,000	67,000	268,000	1.0	1.1	.9	1.2
Indiana	171,000	115,000	70,000	210,000	.8	.7	.5	1.2
Illinois	110,000	110,000	77,000	187,000	1.1	.9	1.1	1.1
Michigan	90,000	72,000	43,000	97,000	1.2	1.4	1.5	1.6
Wisconsin	60,000	122,000	92,000	138,000	1.1	1.9	1.7	1.9
Minnesota	63,000	43,000	42,000	80,000	1.9	2.0	2.3	2.0
Iowa	66,000	95,000	51,000	122,000	.7	1.0	.75	1.0
Missouri	23,000	20,000	22,000	33,000	1.4	1.5	1.7	1.7
Nebraska	9,000	10,000	17,000	12,000	1.2	1.9	1.4	1.7
Kansas	14,000	8,000	13,000	10,000	2.0	1.8	2.1	1.6
Tennessee	4,000	5,000	2,000	3,000	1.6	1.4	2.5	2.0
Montana	3,000	7,000	------	------	3.0	3.1	------	------
Idaho	14,000	13,000	16,000	18,000	3.0	5.0	3.8	4.7
Oregon	4,000	3,000	7,500	15,000	1.5	2.5	3.0	3.5
United States	812,000	814,000	530,500	1,208,000	1.15	1.33	1.37	1.44

State	Production				Price per bushel received by producers Dec. 1			
	1924	1925	1926	1927 [2]	1924 [3]	1925	1926	1927
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
New York	22	12	5	2	14.00	14.30	20.00	19.00
Pennsylvania	26	29	12	22	14.00	15.70	18.50	17.75
Ohio	156	185	60	322	16.00	15.10	19.25	16.00
Indiana	137	80	35	252	14.80	15.40	18.25	15.00
Illinois	121	99	85	206	15.80	15.60	18.75	15.00
Michigan	108	101	64	155	14.00	15.00	18.00	14.70
Wisconsin	66	232	156	262	14.50	14.60	17.70	15.50
Minnesota	120	86	97	160	13.30	14.40	17.50	15.50
Iowa	46	95	38	122	15.20	16.00	18.00	16.10
Missouri	32	30	37	56	13.00	13.60	16.50	13.50
Nebraska	11	19	24	20	13.00	12.00	15.90	15.15
Kansas	28	14	27	16	13.00	12.20	15.00	13.10
Tennessee	6	7	5	6	14.00	16.00	16.48	18.00
Montana	9	22	------	------	12.00	14.00	------	------
Idaho	42	65	61	85	12.00	14.20	17.00	13.50
Oregon	6	8	22	52	12.00	15.00	17.00	14.25
United States	936	1,084	728	1,738	14.49	14.88	17.71	15.25

Bureau of Agricultural Economics. Estimated by the crop-reporting board.

[1] Includes red, alsike, and white. [2] Preliminary. [3] November 15 price.

TABLE 316.—*Timothy seed: Receipts, Chicago, averages 1909–1925, annual 1920–1927*

Year beginning August	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Total
	1,000 lbs.	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
Average:													
1909–1913	2,965	7,614	5,305	3,111	1,698	1,716	2,059	3,082	2,255	695	855	1,238	32,595
1914–1920	3,282	8,951	5,261	3,354	2,418	2,043	2,529	3,612	2,081	1,619	787	685	36,621
1921–1925	6,967	9,908	4,687	2,527	1,580	1,655	1,878	2,244	1,346	796	495	422	34,504
1920	2,347	8,075	5,676	4,009	2,951	1,706	2,076	4,056	2,601	2,368	1,088	579	37,532
1921	10,849	6,239	4,586	3,198	2,317	2,404	2,899	2,828	780	1,263	472	119	37,954
1922	8,967	9,593	4,577	2,048	1,050	570	1,352	1,697	1,243	398	355	124	31,974
1923	5,386	13,397	4,419	1,606	1,329	662	1,298	1,815	1,162	65	315	507	31,961
1924	3,698	12,714	4,845	3,736	1,552	2,138	2,038	2,566	1,809	1,240	664	687	37,687
1925	5,933	7,599	5,009	2,047	1,651	2,499	1,801	2,316	1,734	1,015	667	672	32,943
1926	5,907	7,981	3,368	2,113	1,158	1,588	1,780	2,601	1,481	980	779	516	30,252
1927	6,548	7,387	3,741	3,812	961	------	------	------	------	------	------	------	------

Bureau or Agricultural Economics. Compiled from annual reports of the Chicago Board of Trade.

TABLE 317.—*Forage plant seed: Imports into United States, 1913–1927* [1]

Kind of seed	Year ended June 30													
	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927
	1,000 lbs.	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
Alfalfa	5, 203	6, 930	3, 252	3, 170	45	770	18, 831	942	7, 259	8, 784	12, 818	4, 783	4, 548	5, 134
Canada blue grass	507	1, 043	698	495	1, 229	739	552	1, 148	1, 034	836	817	1, 150	284	882
Awnless brome grass	139	7	(2)	1	------	------	169	9	14	------	------	------	11	------
Alsike clover	2, 688	778	1, 113	4, 329	3, 528	7, 032	5, 648	4, 121	7, 057	5, 566	11, 056	10, 425	10, 989	4, 163
Crimson clover	8, 534	11, 690	4, 504	5, 776	1, 603	1, 484	10, 053	5, 506	3, 443	2, 262	7, 745	4, 834	5, 766	2, 385
Red clover	5, 921	8, 932	32, 509	5, 344	768	1, 051	19, 268	16, 333	10, 391	448	24, 729	6, 541	19, 725	10, 816
White clover	640	373	149	158	53	1	189	516	1, 623	520	1, 408	1, 227	1, 666	975
Biennial white sweet clover	42	194	(3)	195	71	941	2, 215	3, 133	------	------	4, 039	3, 493	5, 879	4, 130
Biennial yellow sweet clover	243	201	(3)	9	------	1	202	235	------	------	222	52	502	174
Clover mixtures	------	------	------	26	169	550	265	23	57	20	74	13	122	24
Grass mixtures	------	------	------	124	6	(2)	3	6	43	(3)	------	200	(2)	------
Spring vetch and oats mixtures	------	------	------	------	------	------	------	4	------	------	------	------	------	------
Meadow fescue	------	------	------	------	------	------	3	------	1	------	(2)	1	13	16
Broomcorn millet	1, 520	1, 305	1, 102	786	1, 584	------	225	152	1, 496	5, 360	595	253	456	(4)
Foxtail millet	523	338	118	260	9	138	146	434	302	65	184	243	125	------
Orchard grass	1, 939	701	754	1, 286	58	177	2, 771	------	2, 922	768	603	992	253	260
Rape	2, 981	3, 966	4, 019	2, 286	11, 316	639	5, 766	4, 245	4, 763	6, 384	6, 600	4, 345	6, 526	6, 788
Perennial ryegrass	1, 429	1, 342	1, 510	1, 668	1, 584	831	1, 958	1, 523	1, 868	1, 834	1, 952	1, 335	2, 302	1, 203
Italian ryegrass	311	485	383	481	606	208	980	577	828	860	1, 034	831	1, 683	833
Timothy	23	18	119	4	22	155	37	391	95	32	(2)	1	3	45
Hairy vetch	2, 477	466	68	296	231	257	1, 220	1, 387	1, 941	1, 599	3, 215	2, 068	3, 986	2, 124
Spring vetch	682	221	62	30	118	435	1, 048	542	345	1, 858	1, 210	1, 266	1, 603	992

Bureau of Agricultural Economics. Compiled mainly from data of the Seed Laboratory, Bureau of Plant Industry.

[1] Imports of perennial and Italian ryegrass and hairy vetch up to and including 1917, and sweet clover for all years, are based on information furnished by United States Customs Service. All other figures represent imports of seed permitted entry under the Federal seed act (formerly designated the seed importation act).
[2] Less than 500 pounds.
[3] Figures missing.
[4] Data not compiled for 1927.

TABLE 318.—*Alfalfa seed: Estimated price per bushel, received by producers, United States, 1912–1927*

Year beginning July	July 15	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	Average
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1912	8. 32	8. 58	9. 02	7. 87	8. 23	7. 86	7. 66	8. 15	8. 19	8. 36	8. 21	8. 08	8. 21
1913	8. 20	7. 96	7. 42	6. 96	6. 36	6. 60	6. 55	6. 48	6. 60	6. 77	6. 77	6. 83	6. 96
1914	6. 92	6. 81	7. 21	7. 29	7. 29	7. 57	7. 61	7. 86	7. 92	8. 45	8. 38	8. 31	7. 52
1915	8. 51	8. 30	7. 94	8. 37	8. 65	8. 88	8. 84	9. 20	10. 02	10. 39	10. 70	10. 10	9. 16
1916	10. 30	9. 33	9. 27	8. 61	8. 30	8. 56	7. 97	7. 75	8. 53	9. 03	8. 85	8. 61	8. 76
1917	8. 71	8. 69	9. 04	9. 04	9. 43	9. 58	10. 14	9. 90	10. 60	10. 53	10. 09	10. 13	9. 66
1918	9. 67	9. 88	10. 04	9. 91	9. 38	9. 65	10. 07	10. 48	10. 64	11. 18	12. 13	11. 79	10. 40
1919	10. 88	11. 34	12. 34	14. 90	15. 23	16. 68	16. 60	19. 57	21. 43	21. 80	22. 40	20. 42	16. 97
1920	19. 41	16. 03	14. 89	13. 35	12. 25	10. 24	9. 95	9. 01	9. 31	8. 71	8. 97	8. 73	11. 74
1921	7. 89	8. 51	8. 53	8. 33	8. 09	7. 63	7. 39	8. 45	7. 50	9. 00	8. 89	8. 48	8. 22
1922	9. 00	7. 74	8. 00	7. 94	8. 50	9. 45	9. 58	9. 96	10. 56	10. 44	10. 59	10. 57	9. 36
1923	10. 25	10. 38	9. 20	10. 75	10. 21	10. 19	10. 43	10. 51	11. 17	11. 41	11. 67	11. 39	10. 63
1924	11. 13	10. 99	10. 74	10. 39	10. 16	10. 33	10. 52	11. 05	11. 72	12. 73	12. 00	10. 99	11. 06
1925	11. 41	9. 88	10. 51	10. 30	10. 65	9. 87	9. 51	9. 48	9. 82	9. 94	9. 92	10. 22	10. 09
1926	9. 79	9. 37	9. 17	8. 94	9. 42	9. 48	10. 12	10. 33	10. 50	11. 04	10. 63	10. 62	9. 65
1927	10. 17	9. 62	9. 69	9. 78	9. 98	9. 74	------	------	------	------	------	------	------

Bureau of Agricultural Economics. Based on returns from special price reporters.

TABLE 319.—*Clover seed: Estimated price per bushel, received by producers, United States, 1910–1927*

Year beginning September	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	July 15	Aug. 15	Weighted av.
Average:	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1910–1913	8.79	8.71	8.62	8.82	9.14	9.74	10.01	10.19	9.97	9.56	9.34	9.40	9.25
1914–1920	13.84	13.87	14.00	14.23	14.76	15.57	16.08	16.44	15.73	14.76	14.44	13.92	14.80
1921–1925	11.15	11.86	12.14	12.85	13.31	13.97	14.68	14.60	14.40	13.56	13.44	12.82	13.09
1910	8.27	8.13	7.70	7.94	8.27	8.37	8.56	8.79	8.74	8.80	8.83	9.65	8.30
1911	10.19	10.33	10.37	10.62	10.89	12.22	12.89	12.91	12.53	11.69	10.64	9.80	11.25
1912	9.39	9.37	9.06	9.00	9.41	10.28	10.42	11.00	10.74	9.77	9.78	9.37	9.71
1913	7.31	7.00	7.33	7.70	7.99	8.07	8.17	8.06	7.87	7.96	8.12	8.76	7.75
1914	9.10	8.24	8.02	8.12	8.51	8.60	8.55	8.36	8.14	7.90	7.96	7.94	8.41
1915	8.49	9.70	9.67	10.01	10.27	10.47	10.76	10.58	9.98	9.47	9.15	9.12	9.98
1916	8.65	8.54	9.20	9.40	9.60	9.87	10.32	10.41	10.40	10.29	10.50	10.53	9.54
1917	10.89	11.92	12.91	13.53	14.48	16.46	17.49	17.86	16.56	15.88	14.71	15.20	14.48
1918	16.61	19.01	20.03	20.67	21.55	21.79	22.61	24.81	24.48	23.37	23.25	24.33	21.01
1919	25.38	26.47	26.53	27.63	28.06	31.21	31.88	32.23	29.84	26.21	25.52	19.97	28.34
1920	17.77	13.18	11.64	10.28	10.82	10.61	10.98	10.80	10.71	10.20	10.00	10.37	11.81
1921	10.25	10.21	10.09	10.38	10.69	11.88	13.00	13.13	12.84	11.60	11.00	9.88	11.14
1922	8.85	9.66	10.18	10.88	11.16	11.52	11.71	11.48	11.20	10.84	10.94	10.46	10.71
1923	11.07	12.20	12.18	12.22	12.51	12.67	13.04	13.09	13.07	12.72	12.42	12.09	12.33
1924	12.15	12.80	13.42	15.31	16.17	16.95	18.19	17.40	16.82	15.48	15.67	14.86	15.35
1925	13.42	14.42	14.85	15.48	16.04	16.83	17.45	17.88	18.08	17.16	17.17	16.83	15.87
1926	16.63	17.21	17.85	17.89	19.07	20.18	21.16	22.75	22.45	22.07	20.69	17.94	19.06
1927	13.78	15.67	15.07	------	------	------	------	------	------	------	------	------	--------

Bureau of Agricultural Economics. Based on returns from special price reporters.

TABLE 320.—*Timothy seed: Estimated price per bushel, received by producers, United States, 1910–1927*

Year beginning August	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	July 15	Weighted av.
Average:	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1910–1913	3.91	3.66	3.72	3.72	3.68	3.74	3.92	4.07	4.12	4.14	3.98	3.92	3.82
1914–1920	3.35	3.21	3.29	3.25	3.30	3.49	3.57	3.69	3.69	3.80	3.66	3.61	3.39
1921–1925	2.82	2.79	2.93	2.85	2.98	3.11	3.19	3.24	3.27	3.20	3.13	3.13	2.97
1910	------	3.77	4.03	4.08	4.11	4.12	4.51	4.93	5.17	5.24	5.24	5.48	4.28
1911	6.52	6.65	6.91	6.90	6.72	6.99	7.26	7.33	7.27	7.16	6.68	5.96	6.87
1912	3.20	2.09	1.95	1.82	1.79	1.79	1.78	1.72	1.74	1.76	1.77	1.94	2.01
1913	2.01	2.13	2.02	2.08	2.10	2.07	2.12	2.30	2.28	2.38	2.23	2.32	2.13
1914	2.43	2.46	2.34	2.34	2.18	2.63	2.66	2.78	2.69	2.75	2.65	2.57	2.49
1915	2.56	2.62	2.72	2.91	2.86	3.05	3.19	3.28	3.51	3.33	3.26	3.08	2.89
1916	2.36	2.22	2.27	2.25	2.31	2.44	2.46	2.70	2.76	3.09	3.09	3.04	2.42
1917	3.23	3.31	3.61	3.25	3.37	3.57	3.78	3.84	3.74	3.84	3.56	3.67	3.50
1918	3.87	3.79	4.08	4.26	4.21	4.34	4.51	4.54	4.69	5.05	4.63	4.49	4.19
1919	4.58	4.55	4.78	4.67	4.98	5.35	5.62	5.61	5.63	5.61	5.46	5.44	4.98
1920	4.44	3.52	3.25	3.09	3.16	3.04	2.75	2.97	2.84	2.90	2.99	2.98	3.29
1921	2.71	2.31	2.70	2.41	2.57	2.70	2.82	2.95	3.11	3.21	2.81	2.53	2.64
1922	2.20	2.28	2.48	2.49	2.69	3.06	2.98	3.00	2.99	2.87	2.92	3.16	2.60
1923	2.63	3.01	3.12	3.15	3.19	3.37	3.56	3.60	3.54	3.48	3.44	3.23	3.19
1924	3.20	3.12	3.16	2.88	3.03	3.04	3.03	3.15	3.24	3.10	3.05	3.47	3.11
1925	3.36	3.21	3.21	3.31	3.41	3.38	3.56	3.51	3.47	3.36	3.41	3.26	3.33
1926	2.68	2.55	2.61	2.46	2.58	2.62	2.70	2.69	2.76	2.69	2.76	2.58	2.61
1927	2.06	1.66	1.58	1.61	1.73	------	------	------	------	------	------	------	--------

Bureau of Agricultural Economics. Based on returns from special price reporters.

TABLE 321.—*Field seeds: Average price per 100 pounds paid to growers for crops of 1920–1927*

ALFALFA SEED

State or State subdivision	1920	1921	1922	1923	1924	1925	1926	1927
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls*	*Dolls.*	*Dolls.*	*Dolls.*
Southern Arizona	17.00	14.35	15.50	16.25	16.25	15.15	13.50	12.60
California	15.90	14.00	14.75	17.00	17.25	13.50	12.70	13.60
Colorado	13.00	11.85	11.60	15.25	15.40	13.75	14.30	14.40
Southern Idaho	11.80	12.00	14.95	15.50	15.00	15.00	14.65	14.30
Northwestern Kansas	14.25	10.65	12.10	15.50	14.65	13.90	13.00	15.75
Southeastern Kansas	16.40	13.60				13.65	13.70	14.00
Southwestern Kansas	14.70	11.35	12.90	15.00	14.70	13.70	13.00	13.10
Montana	17.00	17.85	21.05	19.25	19.50	17.90	16.65	18.55
Nebraska	15.80	10.10	13.90			14.90	16.00	17.75
Eastern New Mexico	14.00	10.80	13.00	14.30	15.80	13.85	11.90	10.75
Western Oklahoma	12.85	11.20	13.30	15.25	13.65	14.20	12.20	13.05
South Dakota	18.75	13.20	17.00	18.35	19.50	18.00	16.25	18.40
Western Texas	20.65	14.75	13.10	14.50	15.50	16.00	12.85	12.50
Utah	16.00	11.75	15.50	16.00	16.00	13.90	14.50	16.00

ALSIKE CLOVER SEED

State or State subdivision	1920	1921	1922	1923	1924	1925	1926	1927
Southern Idaho	22.00	14.50	13.60	13.50	14.10	20.35	24.00	21.10
Northern Illinois	22.05	14.65	13.80	14.20	16.50	19.55	23.10	20.45
Northern Indiana	21.75	14.80	14.55	12.85	15.25	21.75	24.50	21.45
Southern Michigan	20.90	13.50	13.50	12.90	15.40	22.50	22.50	21.50
Minnesota	19.25	13.65	12.95	12.30	15.40	20.00	23.85	20.45
Western New York	21.10	14.50				19.55	24.00	20.75
Northwestern Ohio	22.30	13.30	12.90	13.05	16.20	20.95	26.90	22.80
Western Oregon	23.50	13.65	15.20	13.25	13.55	22.00	23.65	22.45
Northeastern Wisconsin	18.95	14.30	11.80	12.45	13.80	19.40	25.80	21.10
Southeastern Wisconsin	20.20	14.20	12.85	12.25	12.90	19.25	23.80	22.60

RED-CLOVER SEED

State or State subdivision	1920	1921	1922	1923	1924	1925	1926	1927
Idaho	13.95	15.10	16.75	18.25	21.30	25.25	29.05	23.80
Northern Illinois	18.70	16.20	17.25	20.40	27.50	26.35	33.00	25.35
Central Illinois	18.40	16.55	16.55	20.40	27.50	25.90	30.75	24.90
Northern Indiana	19.10	17.00	17.20	19.70	26.35	25.95	30.95	25.20
Central Indiana	18.50	16.55	16.15	19.70	26.35	26.00	33.25	24.90
Northeastern Iowa	17.80	16.45	16.60			24.20	29.40	26.15
Southeastern Iowa	18.30	15.40	16.10	19.85	26.35	23.30	30.05	25.85
Southwestern Iowa	17.25	15.00	17.05			24.40	30.25	25.00
Kansas	15.65	15.30	16.30			22.50	26.65	22.30
Southern Michigan	17.10	16.60	17.35	18.70	27.20	25.80	30.30	25.25
Minnesota	16.75	15.50	17.10	19.00	23.90	23.65	28.20	23.40
Missouri	15.85	16.05	15.55	18.35	21.80	21.65	27.35	21.20
Nebraska	14.65	15.35	16.15			23.05	26.45	23.55
Northwestern Ohio	19.05	17.20	17.55	19.30	27.35	24.85	30.50	26.00
Western Oregon	22.35	15.30	20.10	19.65	23.05	25.65	27.15	23.70
Northeastern Wisconsin	16.30	16.65	17.35	18.30	25.15	24.15	26.55	24.05
Southeastern Wisconsin	18.40	17.55	17.90	19.70	26.35	25.05	27.45	25.60
Southwestern Wisconsin	16.75	16.85	17.45	19.70	26.35	25.00	27.45	24.50

SWEET-CLOVER SEED

State or State subdivision	1920	1921	1922	1923	1924	1925	1926	1927
Colorado	9.90	4.25	4.55	8.60	8.25	6.20	8.20	5.65
Illinois	16.30	10.15	7.10	9.70	10.20	8.70	9.25	7.25
Kansas	8.15	5.10	7.75	9.10	8.80	6.60	8.10	5.20
Minnesota	8.00	4.50	6.85	9.15	8.15	5.00	9.25	5.35
Montana	11.50	5.00	7.00	9.15	8.35	6.30	8.25	5.00
Nebraska	12.50	6.50				6.85	8.00	6.85
North Dakota	9.60	4.40	7.35	9.00	8.35	5.50	9.10	5.35
South Dakota	9.50	5.00	7.00	9.70	8.05	5.35	8.75	5.20
Utah	8.50	3.00		10.00	10.20	5.75	9.15	5.30
Wyoming			8.60	10.25	10.00	7.00	8.75	4.75

TABLE 321.—*Field seeds: Average price per 100 pounds paid to growers for crops of 1920–1927*—Continued

TIMOTHY SEED

State or State subdivision	1920	1921	1922	1923	1924	1925	1926	1927
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Northern and central Idaho	5.25	4.10	4.45	5.50	5.90	----	----	3.15
Northern Illinois	6.50	4.50	4.70	----	----	6.65	4.70	2.80
Central Illinois	6.30	4.85	4.95	6.15	5.75	6.90	4.80	2.90
Southern Illinois	6.75	4.95	5.15	6.00	5.75	6.75	4.50	2.70
Indiana	6.25	4.70	5.15	5.50	5.75	7.05	4.60	2.30
Northeastern Iowa	5.40	4.20	4.70	6.30	5.55	6.50	4.65	2.90
Southeastern Iowa	6.05	4.50	4.60	5.95	5.60	6.80	4.60	3.10
Southwestern Iowa	5.50	4.10	4.55	5.90	5.70	6.70	4.75	3.15
Kansas	5.25	5.60	----	----	----	----	----	2.80
Northwestern Minnesota	5.10	4.35	4.55	----	----	5.15	4.40	2.80
Southern Minnesota	5.50	4.45	4.85	6.25	5.40	6.15	4.55	2.90
Northeastern Missouri	5.75	4.30	4.95	6.05	5.95	6.70	4.75	3.05
Northwestern Missouri	5.50	3.95	4.60	5.55	5.85	6.65	4.60	3.10
North Dakota	5.80	5.20	4.55	----	----	5.00	4.45	2.50
Northeastern Ohio	6.65	4.85	4.95	6.55	5.70	6.70	5.05	2.80
Northwestern Ohio	5.85	4.70	5.00	6.55	5.70	7.05	5.10	2.85
Northeastern South Dakota	5.05	4.45	4.60	5.75	5.05	5.90	4.10	2.50
Southeastern South Dakota	5.65	4.05	4.60	5.95	4.95	5.85	4.50	2.60
Wisconsin	5.90	4.80	5.05	----	----	6.15	5.15	3.10

Bureau of Agricultural Economics. Compiled from annual reports to the bureau from seed shippers.

TABLE 322.—*Alfalfa seed: Average wholesale selling price per 100 pounds at Kansas City and Minneapolis, 1920–1927*

Year	Kansas City						Minneapolis					
	Jan.	Feb.	Mar.	Apr.	May	Av.	Jan.	Feb.	Mar.	Apr.	May	Av.
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Av. 1921–1925	19.68	19.82	20.26	20.71	20.78	20.25	21.11	21.12	21.34	22.07	22.03	21.53
1920	42.00	42.00	40.25	39.00	37.60	40.17	45.60	46.00	44.90	41.65	38.30	43.29
1921	18.50	18.00	18.40	18.50	18.15	18.31	19.00	19.00	19.40	21.40	21.00	19.96
1922	16.90	18.00	18.50	17.90	18.50	17.96	19.00	19.50	19.50	19.80	20.25	19.61
1923	19.50	19.50	19.50	20.65	21.00	20.03	21.25	21.00	20.50	20.75	21.00	20.90
1924	21.50	21.50	22.30	23.00	23.00	22.26	22.50	22.50	23.90	24.90	24.80	23.72
1925	22.00	22.10	22.60	23.50	23.25	22.69	23.80	23.60	23.40	23.50	23.10	23.48
1926	20.00	20.00	20.00	21.00	21.00	20.40	19.00	19.62	20.50	20.50	20.50	20.02
1927	19.50	20.00	20.00	20.00	20.00	19.90	21.00	21.00	20.62	20.88	20.50	20.80

Bureau of Agricultural Economics. Compiled from weekly reports to the bureau from seedsmen in the various markets. These prices are the average wholesale selling prices for high-quality seed.

TABLE 323.—*Red-clover seed: Average wholesale selling price per 100 pounds at Chicago and Toledo, 1920–1927*

Year	Chicago						Toledo					
	Jan.	Feb.	Mar.	Apr.	May	Av.	Jan.	Feb.	Mar.	Apr.	May	Av.
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Av. 1921–1925	24.66	24.52	24.45	23.20	22.17	23.80	24.42	23.58	23.46	22.24	21.81	23.10
1920	55.20	57.00	56.30	50.25	43.20	52.39	57.25	58.50	57.45	49.70	43.50	53.28
1921	21.25	18.05	20.80	19.95	18.55	19.72	21.20	18.30	20.90	21.20	22.80	20.88
1922	22.20	24.55	25.45	23.35	21.95	23.50	23.30	25.40	26.60	23.60	22.90	24.36
1923	22.55	22.45	20.60	19.70	19.35	20.93	22.45	22.30	20.85	19.65	18.80	20.81
1924	23.10	21.55	21.10	19.60	19.00	20.87	22.45	20.50	19.75	18.70	18.40	19.96
1925	34.20	36.00	34.30	33.40	32.00	33.98	32.70	31.40	29.20	28.05	26.15	29.50
1926	32.17	33.50	34.69	34.00	34.00	33.67	26.25	25.41	25.01	23.92	24.70	25.06
1927	38.60	42.31	45.00	44.25	42.38	42.51	----	----	----	----	----	----

Bureau of Agricultural Economics. Compiled from weekly reports to the bureau from seedsmen in the various markets. These prices are the average wholesale selling prices for high-quality seed.

TABLE 324.—*Alsike-clover seed: Average wholesale selling price per 100 pounds at Chicago and Toledo, 1920–1927*

Year	Chicago						Toledo					
	Jan.	Feb.	Mar.	Apr.	May	Av.	Jan.	Feb.	Mar.	Apr.	May	Av.
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Av. 1921–1925	19.53	19.20	19.29	19.20	18.83	19.21	20.31	20.12	20.01	19.91	19.96	20.06
1920	55.80	57.50	58.00	53.25	43.20	53.55	57.70	58.60	59.30	52.60	42.50	54.14
1921	25.65	22.40	22.45	21.60	19.50	22.32	26.60	25.45	25.15	23.10	22.50	24.56
1922	18.20	19.25	19.00	17.30	17.30	18.21	19.35	20.70	19.90	18.80	18.95	19.54
1923	16.50	16.50	16.50	16.45	16.35	16.46	17.90	17.60	17.50	17.50	17.40	17.58
1924	15.55	15.45	15.45	15.90	16.00	15.67	15.55	15.40	14.80	15.25	16.15	15.43
1925	21.75	22.40	23.05	24.75	25.00	23.39	22.15	21.45	22.70	24.90	24.80	23.20
1926	26.08	27.25	27.88	28.19	28.38	27.56	27.22	27.82	28.35	28.35	28.35	28.02
1927	36.01	37.94	39.44	38.71	34.56	37.33						

Bureau of Agricultural Economics. Compiled from weekly reports to the bureau from seedsmen in the various markets. These prices are the average wholesale selling prices for high-quality seed.

TABLE 325.—*Timothy seed: Average wholesale selling price per 100 pounds at Chicago and St. Louis, 1920–1927*

Year	Chicago						St. Louis					
	Jan.	Feb.	Mar.	Apr.	May	Av.	Jan.	Feb.	Mar.	Apr.	May	Av.
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Av. 1921–1925	7.25	7.15	7.07	6.93	6.94	7.07	7.54	7.42	7.18	7.15	7.13	7.28
1920	13.50	13.90	13.30	12.65	12.30	13.13	14.05	14.75	13.65	12.80	12.50	13.55
1921	7.10	6.50	6.40	6.40	6.45	6.57	7.50	7.00	6.60	6.95	7.15	7.04
1922	7.05	7.30	7.30	6.60	6.70	6.99	7.00	7.30	7.00	6.45	6.35	6.82
1923	7.00	7.00	7.05	7.05	7.00	7.02	7.50	7.30	7.15	7.25	7.25	7.29
1924	8.15	8.25	8.10	7.75	7.55	7.96	8.45	8.45	8.25	8.20	8.00	8.27
1925	6.95	6.70	6.50	6.85	7.00	6.80	7.25	7.05	6.90	6.90	6.90	7.00
1926	8.10	8.10	7.99	7.78	7.75	7.94	8.33	8.12	8.00	8.06	8.00	8.10
1927	6.08	6.08	5.86	5.98	5.98	6.00	6.30	6.00	6.00	6.00	6.00	6.06

Bureau of Agricultural Economics. Compiled from weekly reports to the bureau from seedsmen in the various markets. These prices are the average wholesale selling prices for high-quality seed.

TABLE 326.—*Tobacco: Acreage, production, value, exports, etc., United States, 1849, 1859, 1866–1927*

Year	Acreage	Average yield per acre	Production	Price per pound received by producers Dec. 1	Farm value, Dec. 1	Value per acre [1]	Domestic exports, year beginning July 1 [2]	Imports, year beginning July 1 [2]	Net exports, year beginning July 1 [2][3]
	Acres	*Lbs.*	*1,000 lbs.*	*Cts.*	*1,000 dolls.*	*Dolls.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
1849			*199,753*				145,729	2,480	143,812
1859			*434,209*				173,844	6,941	169,700
1866	520,107	735.8	388,129	9.6	37,398	71.90	184,803	3,127	182,486
1867	494,333	634.6	313,724	9.4	29,573	59.82	206,021	4,393	203,020
1868	427,189	751.4	320,982	9.3	29,823	69.81	181,528	5,982	176,163
1869			*262,735*						
1869	481,101	569.1	273,775	9.3	25,520	53.04	185,749	6,257	180,015
1870	330,668	757.9	250,628	9.6	24,010	72.61	215,668	8,395	207,944
1871	350,769	750.3	263,196	8.8	23,293	66.41	234,937	9,562	226,176
1872	416,512	821.8	342,304	9.2	31,648	75.98	213,995	11,023	204,051
1873	480,878	775.3	372,810	7.6	28,422	59.10	318,098	9,690	309,842
1874	281,662	633.2	178,355	11.8	21,067	74.80	223,902	6,769	218,003

[1] Based on farm price Dec. 1.
[2] Compiled from 1849, 1859, 1866–1917 Commerce and Navigation of the United States; 1918 Foreign Commerce and Navigation of the United States; 1919–1927 Monthly Summary of Foreign Commerce of the United States, June issues.
[3] Net exports are domestic exports plus reexports minus imports.

TABLE 326.—*Tobacco: Acreage, production, value, exports, etc., United States, 1849, 1859, 1866–1927*—Continued

Year	Acreage	Average yield per acre	Production	Price per pound received by producers Dec. 1	Farm value, Dec. 1	Value per acre	Domestic exports, year beginning July 1	Imports, year beginning July 1	Net exports, year beginning July 1
	Acres	*Lbs.*	*1,000 lbs.*	*Cts.*	*1,000 dolls.*	*Dolls.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
1875	559, 049	678. 6	379, 347	7. 0	26, 434	47. 32	218, 310	7, 383	211, 670
1876	540, 457	705. 0	381, 002	6. 8	25, 924	47. 97	282, 386	7, 552	275, 100
1877			460, 000				283, 973	7, 981	276, 401
1878	542, 850	723. 1	392, 547	5. 6	22, 093	40. 70	322, 280	6, 593	316, 058
1879	*638, 841*	*739. 9*	*472, 661*						
1879	638, 800	793. 1	506, 663	6. 0	30, 200	47. 28	215, 910	9, 759	207, 034
1880	602, 516	740. 7	446, 297	8. 2	36, 415	60. 44	227, 027	7, 469	220, 262
1881	646, 239	696. 2	449, 880	9. 6	43, 372	67. 11	223, 666	11, 860	212, 563
1882	671, 522	764. 0	513, 078	8. 4	43, 190	64. 32	235, 628	14, 893	221, 639
1883	638, 739	706. 9	451, 546	9. 0	40, 455	63. 34	207, 158	12, 955	195, 026
1884	724, 668	747. 2	541, 504	8. 2	44, 160	60. 94	230, 484	12, 924	218, 724
1885	752, 520	747. 8	562, 736	7. 7	43, 266	57. 49	292, 774	15, 693	278, 373
1886	750, 210	709. 9	532, 537	7. 4	39, 463	52. 61	304, 020	17, 519	286, 570
1887	598, 620	645. 2	386, 240	10. 6	40, 977	68. 45	262, 683	18, 600	245, 661
1888	747, 326	757. 1	565, 795	7. 7	43, 667	58. 43	223, 759	20, 107	205, 229
1889	*695, 301*	*702. 2*	*488, 257*						
1889	695, 300	658. 5	457, 881	6. 9	31, 696	45. 59	255, 647	28, 721	228, 724
1890	722, 028	722. 8	518, 683	8. 3	42, 846	59. 34	249, 233	23, 255	227, 254
1891	738, 216	747. 4	551, 777	8. 5	47, 074	63. 77	255, 432	21, 989	234, 587
1892	720, 189	687. 6	495, 209	9. 3	46, 044	63. 93	266, 083	28, 110	239, 153
1893	702, 952	687. 1	483, 024	8. 1	39, 155	55. 70	290, 685	19, 663	272, 983
1894	523, 103	777. 4	406, 678	6. 8	27, 761	53. 07	300, 992	26, 668	276, 223
1895	633, 950	775. 4	491, 544	7. 2	35, 574	56. 11	295, 539	32, 923	266, 317
1896	594, 749	677. 6	403, 004	6. 0	24, 258	40. 79	314, 932	13, 805	302, 847
1897	[4] 945, 604	646. 0	610, 860	------	--------	------	263, 020	10, 477	254, 907
1898	[4] 933, 868	748. 0	693, 533	------	--------	------	283, 613	14, 036	271, 559
1899	*1, 101, 460*	*788. 1*	*868, 113*						
1899	1, 101, 500	728. 5	802, 397	7. 1	57, 273	52. 00	344, 656	19, 620	326, 939
1900	1, 046, 427	778. 2	814, 345	6. 6	53, 661	51. 28	315, 788	26, 851	290, 915
1901	1, 039, 199	788. 0	818, 953	7. 1	58, 283	56. 08	301, 007	29, 429	273, 770
1902	1, 030, 734	797. 3	821, 824	7. 0	57, 564	55. 85	368, 184	34, 017	337, 902
1903	1, 037, 735	786. 3	815, 972	6. 8	55, 515	53. 50	311, 972	31, 163	236, 335
1904	806, 409	819. 0	660, 461	8. 1	53, 383	66. 20	334, 302	33, 268	304, 694
1905	776, 112	815. 6	633, 034	8. 5	53, 519	68. 96	312, 227	41, 126	273, 912
1906	796, 099	857. 2	682, 429	10. 0	68, 233	85. 71	340, 743	40, 899	302, 506
1907	820, 800	850. 5	698, 126	10. 2	71, 411	87. 00	330, 813	35, 005	297, 657
1908	875, 425	820. 2	718, 061	10. 3	74, 130	84. 68	287, 901	43, 123	247, 155
1909	*1, 294, 911*	*815. 3*	*1, 055, 765*						
1909	1, 294, 900	814. 8	1, 055, 133	10. 1	106, 374	82. 15	357, 196	46, 838	313, 085
1910	1, 366, 100	807. 7	1, 103, 415	9. 3	102, 142	74. 77	355, 327	46, 203	309, 171
1911	1, 013, 000	893. 7	905, 109	9. 4	85, 210	84. 12	379, 845	54, 740	327, 109
1912	1, 226, 000	785. 5	962, 855	10. 8	104, 063	84. 88	418, 797	67, 977	353, 575
1913	1, 216, 100	784. 3	953, 734	12. 8	122, 481	100. 72	449, 750	61, 175	391, 196
1914	1, 223, 500	845. 7	1, 034, 679	9. 8	101, 411	82. 89	348, 346	45, 809	303, 428
1915	1, 369, 900	775. 4	1, 062, 237	9. 1	96, 281	70. 28	443, 293	48, 078	400, 624
1916	1, 413, 400	816. 0	1, 153, 278	14. 7	169, 672	120. 05	411, 599	49, 105	370, 387
1917	1, 517, 800	823. 1	1, 249, 276	24. 0	300, 449	197. 95	289, 171	86, 991	211, 962
1918	1, 647, 100	873. 7	1, 439, 071	28. 0	402, 264	244. 23	629, 288	83, 951	577, 323
1919	*1, 864, 080*	*736. 6*	*1, 372, 993*						
1919	1, 951, 000	751. 1	1, 465, 481	39. 0	570, 868	292. 60	648, 038	94, 005	570, 858
1920	1, 960, 000	807. 3	1, 582, 225	21. 2	335, 675	171. 26	506, 526	58, 923	456, 477
1921	1, 427, 000	749. 6	1, 069, 693	19. 9	212, 728	149. 07	463, 389	65, 225	403, 492
1922	1, 695, 000	735. 6	1, 246, 837	23. 2	289, 248	170. 65	454, 364	73, 796	386, 213
1923	1, 877, 000	807. 2	1, 515, 110	19. 9	301, 096	160. 41	597, 630	52, 380	550, 404
1924	*1, 537, 843*	*719. 4*	*1, 106, 340*						
1924	1, 705, 800	733. 6	1, 251, 343	20. 7	259, 139	151. 92	430, 702	75, 131	357, 178
1925	1, 757, 300	783. 3	1, 376, 628	18. 2	250, 774	142. 70	537, 240	68, 281	470, 651
1926	1, 656, 400	783. 6	1, 297, 889	18. 2	236, 702	142. 90	516, 610	91, 064	426, 778
1927 [5]	1, 610, 200	768. 7	1, 237, 832	21. 5	266, 356	165. 42	--------	--------	--------

Bureau of Agricultural Economics. Italic figures are census returns, other acreage, yield, and production figures are estimates by the crop-reporting board.

[4] Revised on basis of 1899.

[5] Preliminary.

TABLE 327.—*Tobacco: Acreage and production, by States, average 1921–1925, annual 1925–1927*

State	Acreage				Production			
	Av., 1921–1925	1925	1926	1927 [1]	Av., 1921–1925	1925	1926	1927 [1]
	Acres	*Acres*	*Acres*	*Acres*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
Massachusetts	9,120	8,600	6,500	7,100	11,750	10,690	9,412	8,683
Connecticut	29,280	29,600	21,900	23,600	38,812	40,019	29,346	28,886
New York	2,000	2,000	1,200	800	2,304	2,200	1,320	960
Pennsylvania	43,400	41,000	33,000	33,000	58,386	57,400	43,560	44,880
Ohio	49,020	52,100	44,200	29,000	42,859	50,745	37,389	24,012
Indiana	19,200	21,000	14,700	8,400	17,054	18,291	12,995	6,384
Wisconsin	40,400	32,000	29,000	31,000	46,980	44,000	33,350	31,620
Missouri	4,800	5,000	5,000	4,000	4,442	4,075	4,750	4,400
Maryland	28,200	30,000	31,000	32,000	21,833	24,690	26,040	26,176
Virginia	198,000	200,000	189,000	178,000	133,092	129,400	137,032	129,940
West Virginia	8,600	9,000	10,000	7,500	6,868	6,975	8,500	6,000
North Carolina	516,800	547,000	565,000	650,000	316,277	380,165	386,460	468,000
South Carolina	91,400	96,000	85,000	104,000	59,178	71,040	56,780	75,920
Georgia	29,800	67,000	51,900	81,500	20,879	48,240	39,963	59,088
Florida	4,800	7,000	6,000	8,800	4,303	5,824	5,808	8,228
Kentucky	490,400	479,000	426,000	319,500	411,920	387,990	358,368	242,820
Tennessee	126,200	130,000	136,000	91,000	94,501	94,380	106,216	71,435
Louisiana	1,000	1,000	1,000	1,000	454	504	400	400
United States	1,692,420	1,757,300	1,656,400	1,610,200	1,291,922	1,376,628	1,297,880	1,237,832

Bureau of Agricultural Economics. Estimates by the crop-reporting board.

[1] Preliminary.

TABLE 328.—*Tobacco: Yield per acre and estimated price per pound, December 1, by States, average 1914–1920, 1921–1925, annual 1923–1927*

State	Yield per acre							Estimated price per pound						
	Av., 1914–1920	Av., 1921–1925	1923	1924	1925	1926	1927	Av., 1914–1920	Av., 1921–1925	1923	1924	1925	1926	1927
	Lbs.	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
Massachusetts	1,500	1,286	1,410	1,340	1,243	1,448	1,223	31.8	32.1	43.8	26.8	16.0	35.0	37.0
Connecticut	1,528	1,322	1,388	1,370	1,352	1,340	1,224	32.3	35.8	46.5	32.3	19.0	35.6	36.0
New York	1,257	1,152	1,125	1,175	1,100	1,100	1,200	17.7	24.1	20.0	22.3	22.0	19.0	18.0
Pennsylvania	1,401	1,343	1,310	1,250	1,400	1,320	1,360	14.8	15.8	18.1	15.7	15.0	10.5	13.0
Ohio	930	882	910	705	974	846	828	17.4	16.6	14.4	19.4	15.0	10.1	15.6
Indiana	893	888	899	893	871	884	760	17.6	16.1	14.0	16.6	18.0	9.7	17.0
Wisconsin	1,171	1,166	1,093	940	1,375	1,150	1,020	16.7	11.6	11.0	13.6	16.5	13.8	10.0
Missouri	984	918	1,100	852	815	950	1,100	22.2	25.8	28.0	25.0	27.0	15.0	22.0
Maryland	783	773	792	765	823	840	818	20.2	22.1	28.1	26.0	19.0	23.7	19.0
Virginia	687	667	740	650	647	725	730	22.6	20.2	19.6	21.4	15.6	17.6	19.3
West Virginia	801	797	860	775	775	850	800	25.4	21.5	22.0	21.4	18.2	13.1	19.5
North Carolina	638	607	700	577	695	684	720	26.9	25.6	23.1	25.8	23.0	26.4	25.8
South Carolina	662	645	730	485	740	668	730	17.5	17.4	19.0	17.0	17.0	23.3	20.5
Georgia	856	652	661	777	720	770	725	33.8	24.7	31.0	26.6	15.0	24.0	19.4
Florida	1,026	931	1,073	750	832	968	935	41.2	41.3	50.9	37.6	31.0	37.8	35.0
Kentucky	876	839	855	836	810	842	760	18.7	16.9	16.6	17.1	16.0	10.6	16.5
Tennessee	789	749	750	795	726	781	785	15.3	18.4	14.3	18.6	17.0	10.5	18.0
Louisiana	425	454	465	400	504	400	400	42.6	54.0	50.0	55.0	55.0	45.0	45.0
United States	813.2	761.9	807.2	733.6	783.3	783.6	768.7	20.8	20.4	19.9	20.7	18.2	18.2	21.5

Bureau of Agricultural Economics. Estimates by crop-reporting board.

TABLE 320.—*Tobacco by types: Acreage, yield per acre, production, price per pound, and farm value, 1926 and 1927*

TYPES OTHER THAN CIGAR

Class and type	U. S. type No.	Acreage 1926	Acreage 1927	Yield per acre 1926	Yield per acre 1927	Production 1926	Production 1927	Average price per pound 1926	Average price per pound 1927	Farm value 1926	Farm value 1927	Value per acre 1926	Value per acre 1927
		Acres	*Acres*	*Pounds*	*Pounds*	*1,000 pounds*	*1,000 pounds*	*Cents*	*Cents*	*1,000 dollars*	*1,000 dollars*	*Dollars*	*Dollars*
Class 1, flue-cured:													
Old belt—													
Virginia	11	121,200	126,200	679	694	82,295	87,580	23.6	23.5	19,422	20,581	160.25	163.10
North Carolina	11	228,000	270,000	655	700	149,340	189,000	26.2	26.0	39,127	49,140	171.60	182.00
Total, old belt	11	349,200	396,200	663	698	231,635	276,580	25.3	25.2	58,549	69,721	167.65	175.95
New belt—													
North Carolina	12	305,000	340,000	700	729	213,500	247,700	27.0	26.5	57,645	65,641	189.00	193.05
Do	13	28,000	38,000	750	785	21,000	29,800	24.1	20.4	5,061	6,079	180.75	159.95
South Carolina	13	85,000	104,000	668	730	56,780	75,920	23.3	20.5	13,230	15,564	155.65	149.65
Georgia	14	51,100	80,500	765	720	39,095	57,960	23.6	18.9	9,226	10,954	180.55	136.05
Florida	14	3,100	5,400	796	751	2,478	4,053	23.0	19.0	570	770	183.85	142.60
Total, new belt		472,200	567,900	705	732	332,853	415,433	25.8	23.8	85,732	99,008	181.55	174.35
Total, flue-cured		821,400	964,100	687	718	564,488	692,013	25.6	24.4	144.281	168,729	175.65	175.00
Class 2, fire-cured:													
Virginia Dark	21	55,200	41,400	794	800	43,820	33,120	7.8	9.5	3,419	3,146	61.95	76.00
Clarksville and Hopkinsville	22												
Kentucky	22	50,000	39,500	825	710	41,250	28,045	6.9	13.6	2,846	3,814	56.90	96.55
Tennessee	22	70,000	48,400	775	756	54,250	36,590	9.6	17.0	5,208	6,220	74.40	128.50
Total, Clarksville and Hopkinsville	22	120,000	87,900	796	735	95,500	64,635	8.4	15.5	8,054	10,034	67.10	114.50
Paducah	23												
Kentucky	23	35,000	21,000	815	748	28,525	15,708	5.9	10.0	1,683	1,571	48.10	74.80
Tennessee	23	8,000	5,500	650	700	5,200	3,850	6.5	11.0	338	424	42.25	77.10
Total, Paducah	23	43,000	26,500	784	738	33,725	19,558	6.0	10.2	2,021	1,995	47.00	75.30
Henderson Stemming	24	11,000	9,000	896	720	9,856	6,480	7.4	8.7	729	564	66.25	62.65
Total, fire-cured		229,200	164,800	798	751	182,910	123,793	7.8	12.7	14,223	15,739	62.05	95.50

Class 3, air-cured:													
Burley—													
Virginia	31	3,600	2,800	1,030	1,000	3,708	2,300	15.1	22.5	560	630	155.55	225.00
West Virginia	31	10,000	7,500	850	800	8,500	6,000	13.1	19.5	1,114	1,170	111.40	156.00
North Carolina	31	4,000	2,000	650	750	2,620	1,500	12.0	21.0	314	315	78.50	157.50
Ohio	31	16,000	9,000	850	811	13,600	7,295	13.6	21.0	1,850	1,532	115.60	170.20
Indiana	31	13,100	7,300	789	760	11,512	5,548	10.3	18.3	1,186	1,014	90.55	138.90
Missouri	31	5,000	4,000	950	1,100	4,750	4,400	15.0	22.0	713	968	142.60	242.00
Kentucky	31	255,000	198,500	836	779	213,180	154,632	13.3	22.0	28,353	34,019	111.20	171.40
Tennessee	31	52,900	32,700	816	843	43,145	27,563	12.5	22.7	5,392	6,257	101.90	191.35
Total, Burley	31	359,600	263,800	837	795	301,015	209,738	13.1	21.9	39,482	45,905	109.80	174.00
Maryland export	32	31,000	32,000	840	818	26,040	26,176	23.7	[1] 19.0	6,171	4,973	199.05	155.40
Ohio export	32	600	800	1,000	1,063	600	850	15.0	18.0	90	153	150.00	191.25
Total, Maryland and Ohio export	32	31,600	32,800	843	824	26,640	27,026	23.5	19.0	6,261	5,126	198.15	156.30
One sucker—													
Indiana	35	1,400	1,000	981	756	1,373	756	5.0	8.0	69	60	49.30	60.00
Kentucky	35	28,000	15,500	920	730	25,760	11,315	5.8	10.0	1,494	1,131	53.35	73.00
Tennessee	35	5,100	4,400	710	780	3,621	3,432	4.9	9.0	177	309	34.70	70.25
Total, one sucker	35	34,500	20,900	891	742	30,754	15,503	5.7	9.7	1,740	1,500	50.45	71.75
Green River	36	47,000	36,000	851	740	39,997	26,640	7.4	8.6	2,960	2,291	63.00	63.65
Virginia sun-cured	37	9,000	7,600	800	848	7,200	6,440	9.5	10.5	684	676	76.00	88.95
Total, air-cured		481,700	361,100	842	790	405,606	285,347	12.6	19.4	51,127	55,498	106.15	153.70
Miscellaneous, Louisiana		1,000	1,000	400	400	400	400	45.0	45.0	180	180	180.00	180.00
Total, all types other than cigar		1,533,300	1,491,000	752	739	1,153,404	1,101,553	18.2	21.8	209,811	240,146	136.85	161.05

CIGAR TYPES

Class 4, filler:													
Pennsylvania Seed Leaf	41	32,000	32,400	1,321	1,362	42,270	44,120	10.2	12.9	4,312	5,697	134.75	175.85
Miami Valley types	42–44	27,800	19,300	838	826	23,299	15,947	8.5	14.0	1,970	2,228	70.85	115.45
Georgia-Florida Sun Sumatra	45	1,400	1,600	1,172	1,203	1,641	1,925	20.0	20.0	328	385	231.30	240.65
Total, filler types		61,200	53,300	1,098	1,163	67,210	61,992	9.8	13.4	6,610	8,310	108.00	155.90

[1] Only a few hogsheads of the 1927 crop of Maryland tobacco were sold to Jan. 1. Normally the first marketings contain a relatively high percentage of ground leaves which depress the price.

TABLE 329.—*Tobacco by types: Acreage, yield per acre, production, price per pound, and farm value, 1926 and 1927*—Continued

CIGAR TYPES—Continued

Class and type	U. S. type No.	Acreage		Yield per acre		Production		Average price per pound		Farm value		Value per acre	
		1926	1927	1926	1927	1926	1927	1926	1927	1926	1927	1926	1927
Class 5, binder:													
Broadleaf—		*Acres*	*Acres*	*Pounds*	*Pounds*	*1,000 pounds*	*1,000 pounds*	*Cents*	*Cents*	*1,000 dollars*	*1,000 dollars*	*Dollars*	*Dollars*
Connecticut Valley	51	12,450	11,450	1,403	1,310	17,462	15,004	25.0	21.0	4,366	3,151	350.70	275.20
Havana Seed—													
Connecticut Valley	52	10,390	11,800	1,494	1,322	15,527	15,602	26.0	23.5	4,037	3,659	388.55	310.10
New York	53	1,200	800	1,100	1,200	1,320	960	19.0	18.0	251	173	209.15	216.25
Pennsylvania	53	1,000	600	1,293	1,267	1,290	760	20.2	18.0	261	137	261.00	228.35
Wisconsin—													
Southern	54	17,500	19,000	1,196	1,039	20,925	19,740	12.9	16.0	2,704	3,158	154.50	166.20
Northern	55	11,500	12,000	1,080	990	12,425	11,880	15.3	24.0	1,902	2,851	165.40	237.60
Total, binder types		54,040	55,650	1,276	1,149	68,949	63,946	19.6	20.5	13,521	13,129	250.20	235.90
Class 6, wrapper:													
Connecticut Valley Shade	61	5,210	7,000	1,004	900	5,231	6,300	97.7	105.0	5,111	6,615	981.00	945.00
Georgia-Florida Shade	62	2,300	2,800	1,112	1,206	2,557	3,378	65.0	65.0	1,663	2,196	723.05	784.30
Connecticut Valley Primed Havana Seed	65	350	450	1,537	1,473	538	663	35.0	58.8	188	390	537.15	866.65
Total, wrapper types		7,860	10,250	1,059	1,009	8,326	10,341	83.6	89.0	6,962	9,201	885.75	897.65
Total, cigar types		123,100	119,200	1,174	1,143	144,485	136,279	18.8	22.5	27,093	30,640	220.10	257.05
Total, all types		1,656,400	1,610,200	783.6	768.7	1,297,889	1,237,832	18.2	21.9	236,904	270,786	143.00	168.15

Bureau of Agricultural Economics. Estimates of crop-reporting board.

NOTE.—Statistics for 1927 are preliminary and subject to revision when the results of the present marketing season are known.

TABLE 330.—*Tobacco: Acreage, yield per acre, and production in specified countries, average 1909–1913, annual 1924–1927*

Country	Acreage					Yield per acre					Production				
	Average 1909–1913 [1]	1924	1925	1926	1927, preliminary	Average 1909–1913 [1]	1924	1925	1926	1927, preliminary	Average 1909–1913 [1]	1924	1925	1926	1927, preliminary
NORTH AMERICA, CENTRAL AMERICA, AND WEST INDIES	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Pounds*	*Pounds*	*Pounds*	*Pounds*	*Pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Canada	[2] 15	21	28	33	44	[2] 1,004	891	1,045	873	998	[2] 15,066	18,711	29,266	28,824	43,917
United States	1,223	1,706	1,757	1,656	1,610	814	733	784	784	769	993,087	1,251,343	1,376,623	1,297,889	1,237,832
Mexico		30	39	37			748	528	547		[2] 29,096	22,455	20,578	20,256	
Cuba											[3] 73,666	[3] 84,000	[3] 72,000	[3] 48,720	
Dominican Republic											[4] 25,417	[3] 29,000	[3] 45,000	[3] 17,500	[3] 35,000
Porto Rico	[5] 19	[4] 40	34	50	77	[6] 489	700	688	700	606	[6] 10,828	28,000	23,403	35,600	46,664
EUROPE															
Sweden	[2] 1	1	1	1		[2] 1,507	1,299	1,733	1,667		1,744	1,299	1,733	1,667	
Belgium	10	6	8	7	8	2,077	2,505	2,116	1,879	1,686	20,767	15,031	16,925	13,153	13,492
France	41	43	40	39		1,307	1,833	1,733	1,480		53,598	78,829	69,308	57,733	
Italy	20	84	101	97	[3] 99	1,148	1,085	915	1,008	889	22,964	91,105	92,373	97,789	[3] 88,000
Germany	32	24	20	16	23	2,004	1,977	2,095	1,986	1,792	64,116	47,452	41,902	31,769	[3] 41,226
Czechoslovakia	8	10	13	14	13	1,183	1,272	1,166	1,038	1,204	9,467	12,720	15,160	14,532	15,653
Hungary	93	38	38	52		1,203	1,001	992	1,101		111,883	38,015	37,687	57,266	
Yugoslavia	35	87	37	38	28	912	904	719	838	393	31,920	78,671	26,560	31,863	[3] 11,000
Greece	[6] 76	148	203	161		[6] 776	510	637	774		[6] 58,987	75,469	129,243	124,562	114,145
Bulgaria	36	122	127	78	63	651	889	694	768	553	23,435	108,447	88,115	59,942	31,811
Rumania	[5] 53	77	91	75	76	[5] 909	614	397	537	526	[5] 48,174	47,290	36,059	40,307	[3] 40,000
Poland	8	2	2	4		1,091	698	938	1,282		8,725	1,397	1,875	5,129	[3] 8,800
Russia	167	133	186			1,378	1,521	2,097			230,142	202,229	390,014	368,351	
NORTH AFRICA															
Algeria	25	55	81	62	37	924	701	811	438	541	23,709	38,578	65,655	27,183	20,018
Tunis	(7)	1	1	1	1	1,209	856	1,212	863	772	266	856	1,212	863	772
French West Africa		41	33				1,694	2,105				69,471	69,471		
ASIA															
Turkey											[3, 6] 88,180	[3] 170,000	[3] 104,500	[3] 84,000	[3] 95,000
Palestine		7	3	2			581	478	530			4,067	1,495	1,059	
Syria and Lebanon	[6, 8] 2	8	8	7	6	[6, 8] 180	809	780	731	467	[6, 8] 360	6,473	6,239	5,114	2,800
British India	1,057	1,276	1,301								[6, 9] 450,000				
Ceylon	14	13		13			770		692			10,009	8,995	8,995	
Japan	72	95	91	91	91	1,302	1,480	1,576	1,454	1,626	93,717	140,567	143,425	132,278	147,986
Chosen (Korea)	51	40	31	34	43	500	804	723	649		25,510	32,173	22,423	22,050	
Taiwan (Formosa)	1	2	2	2		1,120	1,418	1,102	1,101		1,120	2,836	2,204	2,202	
Siam	26	23	22				810	722				18,631	15,885		
Philippine Islands	154	178	177	185		422	537	522	542		65,005	95,509	92,377	100,199	

[1] Averages for European countries are estimates for territory within present boundaries. [2] 2-year average. [3] Unofficial estimate. [4] 3-year average. [5] 4-year average. [6] 1 year only. [7] Less than 500 acres. [8] Greater Lebanon only. [9] Unofficial estimate for production in British India.

TABLE 330.—*Tobacco: Acreage, yield per acre, and production in specified countries, average 1909–1913, annual 1924–1927*—Continued

Country	Acreage					Yield per acre					Production				
	Average 1909–1913	1924	1925	1926	1927, preliminary	Average 1909–1913	1924	1925	1926	1927, preliminary	Average 1909–1913	1924	1925	1926	1927, preliminary
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Pounds*	*Pounds*	*Pounds*	*Pounds*	*Pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
SOUTH AMERICA															
Chile	[4] 2	5	5	------	------	[4] 2,672	2,810	2,104	------	------	[5] 4,493	14,050	10,519	------	------
Brazil	------	166	------	------	------	------	785	------	------	------	[6] 110,000	130,311	126,411	[3] 163,747	------
Uruguay	3	1	(7)	(7)	------	1,046	502	1,181	1,015	------	3,137	502	353	411	------
Paraguay	[5] 17	29	------	------	------	[5] 1,050	953	------	------	------	[5] 17,844	[3] 27,646	[3] 9,921	------	------
Argentina	27	22	21	22	------	468	1,062	1,011	956	------	12,635	23,369	21,226	21,030	------
SOUTH AFRICA															
French Equatorial Africa	------	10	------	------	------	------	77	------	------	------	------	772	------	------	------
Belgian Congo	------	2	1	------	------	------	352	573	------	------	------	705	573	------	------
Union of South Africa	[6] 19	[10] 24	------	------	------	[6] 787	572	------	------	------	[6] 14,961	[11] 13,721	[12] 16,500	------	------
Southern Rhodesia [10]	[5] 4	8	14	33	------	[5] 498	301	404	528	------	[5] 1,992	2,406	5,660	17,420	------
Northern Rhodesia [10]	(7)	4	5	------	------	------	349	414	------	------	------	1,397	2,071	------	------
Nyasaland	7	21	[10] 22	[10] 23	------	431	404	244	280	------	3,017	8,488	[10] 5,361	[10] 6,446	------
Madagascar	[4] 9	14	15	14	------	[4] 467	1,496	1,323	1,365	------	[4] 4,203	20,944	19,841	19,114	------
OCEANIA															
Dutch East Indies:															
Java and Madura [13]	65	69	65	68	------	1,451	1,080	1,311	1,265	------	94,302	74,513	85,228	85,999	------
Sumatra (east coast)	------	47	[3] 46	[3] 46	------	------	779	820	837	------	46,278	[3] 36,617	[3] 37,735	[3] 38,504	[3] 39,683
Australia	2	2	------	------	------	1,068	508	------	------	------	2,135	1,015	[3] 2,240	------	------
Total all countries reporting acreage or production all years shown	1,601	2,375	2,427	2,258	2,218	------	------	------	------	------	1,587,851	2,197,727	2,281,335	2,086,201	2,036,799
Estimated world total, exclusive of India and China [14]	------	------	------	------	------	------	------	------	------	------	2,671,000	3,401,000	3,579,000	3,415,000	------

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture except as otherwise stated. Figures refer to the crop harvested in the calendar year in the Northern Hemisphere and the succeeding harvest in the Southern Hemisphere.

[3] Unofficial estimate. [4] 3-year average. [5] 4-year average. [6] 1 year only. [7] Less than 500 acres.
[10] Cultivation by Europeans only.
[11] Including 1,164,000 pounds produced by the natives.
[12] Estimated on the basis of an officially reported 20 per cent increase in production over the previous year.
[13] European production, including also some tobacco purchased from the natives. No figures for native production are available. Total production of the islands is roughly estimated, on the basis of an average yield of 311 pounds per acre for the native area with the addition of the estimated net European production, at approximately 195,000,000 pounds in 1924, 167,000,000 pounds in 1925, and 170,000,000 pounds in 1926.
[14] No reliable data are available on production in India or China. The acreage devoted to tobacco in India would indicate a production next to that of the United States in the size of the crop. China is also of considerable importance.

TABLE 331.—*Tobacco, unmanufactured: United States exports by classes, 1923–1927*

Countries to which exported	Year ended Dec. 31				
	1923	1924	1925	1926	1927
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Bright flue-cured:					
United Kingdom	93,268	121,040	131,034	120,564	166,655
Irish Free State	(1)	(1)	481	851	1,266
China	25,995	58,509	78,824	82,669	45,384
Hong Kong	420	611	2,239	370	191
Australia	14,350	17,093	19,638	20,843	17,247
Canada	6,671	11,167	9,445	13,517	13,037
Japan	4,385	11,208	7,741	7,188	9,991
Germany	16,752	16,743	5,988	12,385	12,809
British India	3,396	6,044	4,597	4,445	3,832
Netherlands	4,659	10,968	4,086	6,558	7,189
Denmark [2]	1,832	2,182	3,256	2,081	2,863
Java and Madura	65	359	3,016	4,666	8,131
Poland and Danzig	918	1,407	2,508	446	4,739
Belgium	2,310	3,109	2,009	1,065	1,625
Norway	1,172	968	825	959	1,454
Other countries	3,789	4,107	2,592	8,728	5,959
Total	179,982	265,515	278,279	287,335	302,372
Burley:					
Belgium	2,393	1,045	2,295	3,450	5,695
France	1,563	1,096		413	229
United Kingdom	585	1,844	1,399	306	432
Irish Free State	(1)	(1)		2	
Portugal	498	1,396	1,248	1,094	2,363
Netherlands	184	795	200	136	3,332
Germany	263	443	33	197	1,618
Other countries	515	779	842	1,131	4,185
Total	6,001	7,398	6,017	6,729	17,854
Dark fired Kentucky and Tennessee:					
United Kingdom	19,990	17,925	22,023	15,734	9,149
Irish Free State	(1)	(1)	626	2,105	455
Spain	14,166	31,104	15,025	1,479	19,423
France	20,322	33,527	12,253	32,823	20,769
Germany	8,033	17,805	11,471	10,453	10,027
Italy	31,038	15,508	10,212	4,066	385
Netherlands	10,434	13,852	9,071	13,611	8,039
British West Africa	4,668	5,111	7,059	4,399	5,426
Poland and Danzig	1,218	991	7,015		2,788
Belgium	20,591	12,858	6,639	14,411	13,956
Denmark [2]	1,160	1,098	2,113	1,562	1,735
Argentina	2,615	2,006	1,886	1,909	3,343
Switzerland	2,063	1,357	1,259	2,305	1,622
Haiti	1,049	1,037	1,235	1,092	254
Algeria and Tunis	3,201	2,535	1,059	1,600	1,666
Norway	1,061	1,589	1,058	731	684
Portugal	1,119	2,912	924	1,786	2,531
Sweden	3,897	1,385	532	3,610	2,448
Other countries	4,255	7,628	5,514	6,174	7,315
Total	150,880	170,228	116,974	119,847	112,015
Dark Virginia:					
United Kingdom	24,504	6,527	4,889	3,626	1,357
Irish Free State	(1)	(1)	34		89
Germany	3,786	3,585	3,621	3,571	5,493
Netherlands	2,851	2,726	2,971	2,341	2,807
Australia	3,940	3,144	2,912	2,480	2,336
China	2,662	3,947	399	70	1,774
Norway	1,700	2,285	1,506	2,293	2,020
Belgium	1,395	655	101	528	1,295
Canada	1,399	1,828	363	20	283
Sweden	608	1,916	606	95	282
Denmark [2]	627	629	405	100	142
British West Africa	576	423	368	232	399
France	563	313	232	514	1,631
Other countries	3,749	3,093	1,936	2,520	4,394
Total	48,360	31,071	20,343	18,390	24,302

[1] Included with United Kingdom. [2] Denmark and Faroe Islands beginning Jan. 1, 1926.

TABLE 331.—*Tobacco, unmanufactured: United States exports by classes, 1923–1927*—Continued

Countries to which exported	Year ended Dec. 31				
	1923	1924	1925	1926	1927
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Maryland and Ohio export:					
France	6,677	6,196	6,404	5,610	8,956
Netherlands	5,828	3,663	2,947	4,595	5,315
Belgium	1,187	618	1,693	528	885
Germany	1,542	591	297	578	942
Italy	831	645	755	547	1,075
Switzerland	692	365	581	946	1,169
Other countries	1,305	752	1,236	788	1,694
Total	18,062	12,830	13,913	13,592	20,036
Green River (Pryor) and one sucker leaf:					
United Kingdom	10,099	6,093	9,018	3,638	4,633
Irish Free State	(1)	(1)	308	122	135
British West Africa	32	446	2,798	3,122	3,434
China	36	2,568	2,286	2,663	1,025
Italy	1,590			4	52
Germany	483	672		191	84
Belgium	1,025	2,097	700	1,491	2,488
Netherlands	537	2,978	573	178	142
Algeria and Tunis	78	239			3
Other French Africa		298	1,032	1,173	812
Other countries	178	694	1,256	1,494	6,391
Total	14,053	16,085	17,971	14,076	19,199
Other, including cigar leaf and black fat water baler and dark African:					
China	12,229	6,641	1,089	302	47
United Kingdom	5,972	6,220	2,714	407	291
Irish Free State	(1)	(1)	2		
Germany	5,860	4,324	123	383	413
Australia	5,034	390	7	7	2
Belgium	4,888	4,059	818	120	350
British West Africa	4,467	2,859	1,029	640	800
Netherlands	3,220	6,643	956	1,678	657
Canada	2,748	1,556	1,500	1,513	1,730
Spain	1,769	576			16
Mexico	843	713	1,329	758	178
Sweden	833	1,739		(3)	3
British India	272	1,005	(3)	112	
Algeria and Tunis	199	365	274	59	11
Other French Africa	1,761	1,515	754	578	560
Poland and Danzig	799	54			83
Portugal	790	125		27	
Japan	876	601	(3)	42	5
France	709	323	2,650	10,225	4,019
Argentina	370	13	385	9	
Other countries	3,516	3,707	1,344	1,910	1,299
Total	57,157	43,428	14,974	18,800	10,464
Stems, trimmings, and scrap:					
Germany	11,677	9,411	1,775	3,049	597
Netherlands	5,141	12,730	276	260	226
Spain	1,121	2,441	1,492		6
Sweden	1,095	520	1,781	279	1,820
Belgium	1,064	1,337	908	559	167
China	850	861	972	3,169	1,895
Rumania			595		
France		33	404		39
Other countries	1,898	1,510	814	993	883
Total	22,846	28,843	9,017	8,309	5,633
Total tobacco leaf	474,500	546,555	468,471	478,769	506,242

Compiled from Foreign Commerce and Navigation of the United States, 1923–1926 and official records of the Bureau of Foreign and Domestic Commerce, 1927.

1 Included with United Kingdom.

3 Less than 500 pounds.

TABLE 332.—*Tobacco (unmanufactured): International trade, average 1909–1913, annual 1923–1926*

Country	Year ended Dec. 31									
	Average 1909–1913		1923		1924		1925		1926, preliminary	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
PRINCIPAL EXPORTING COUNTRIES	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Algeria	4, 776	11, 681	8, 596	17, 516	10, 573	30, 112	6, 994	24, 625	7, 810	32, 828
Brazil	620	59, 991	2, 030	79, 976	2, 690	64, 674	3. 260	76, 830	-------	61, 504
British India	6, 538	28, 874	9, 205	37, 891	12, 434	53, 084	[1] 6, 693	[1] 33, 600	[1] 5, 157	[1] 33,306
Bulgaria	(2)	4, 310	-------	37, 808	-------	69, 963	-------	74, 179	-------	60, 546
Ceylon	-------	4, 093	4	2, 951	2	4, 159	2	2, 852	3	1, 973
Cuba	141	38, 035	(2)	28, 809	-------	31, 660	-------	18, 072	-------	22, 788
Dominican Republic	-------	22, 395	-------	35, 976	-------	34, 745	-------	49, 075	-------	21, 504
Dutch East Indies	8, 074	163, 823	1, 174	115, 736	2, 763	151, 744	6, 148	202, 646	-------	-------
Greece	12, 024	18, 113	57	47, 104	45	92, 225	-------	-------	-------	-------
Hungary	-------	-------	2, 814	5, 738	4, 725	8, 966	4, 602	4, 664	10, 433	3, 240
Paraguay	-------	11, 361	99	17, 970	-------	14, 295	-------	18, 883	-------	10, 920
Philippine Islands	45	26, 018	132	55, 736	269	49, 505	531	38, 420	-------	31, 611
Russia	1, 084	23, 283	[3] 4	[3] 11, 123	-------	[3] 5, 634	-------	[3] 3, 419	-------	[3] 3, 131
United States	52, 768	381, 127	57, 670	497, 347	68, 589	575, 398	77, 690	477, 488	67, 906	487, 077
PRINCIPAL IMPORTING COUNTRIES										
Argentina	14, 988	41	28, 183	475	13, 346	4, 136	20, 131	279	[4] 18,525	[5] 123
Australia	13, 740	(2)	[6] 26,234	-------	[6] 19, 111	[6] 36	-------	-------	-------	-------
Austria	[7] 49,984	[7] 23,192	30, 101	81	18, 606	1, 484	25, 682	1, 392	29, 235	737
Belgium	22, 094	33	41, 454	848	45, 969	114	43, 389	111	41, 812	49
Canada	17, 891	433	13, 966	1, 837	18, 035	4, 313	14, 848	2, 516	16, 100	5, 508
China	15, 113	25, 487	42, 042	29, 697	90, 344	27, 764	73, 558	27, 457	100, 678	28, 962
Czechoslovakia	-------	-------	39, 480	23	40, 687	(2)	45, 551	-------	41, 497	29
Denmark	8, 774	100	11, 883	1, 189	9, 578	39	10, 043	-------	12, 025	-------
Egypt	19, 005	-------	15, 845	(2)	16, 356	1	16, 709	(2)	16, 370	(2)
Finland	9, 597	-------	6, 339	-------	7, 259	-------	6, 686	-------	6, 249	-------
France	63, 914	26	65, 019	775	58, 537	625	119, 014	551	98, 522	695
Germany	168, 437	116	146, 579	633	230, 098	522	270, 225	578	135, 346	672
Irish Free State	-------	-------	-------	-------	9, 908	442	9, 309	228	7, 896	473
Italy	47, 732	3, 008	41, 304	869	35, 712	2, 531	25, 609	6, 980	12, 970	6, 997
Japan	1, 707	696	4, 296	2, 298	18, 724	4, 532	9, 920	3, 655	10, 284	1, 434
Netherlands	57, 218	3, 786	62, 847	5, 395	65, 898	5, 549	67, 603	3, 230	70, 951	3, 327
Norway	3, 994	-------	5, 944	-------	5, 457	-------	4, 360	-------	4, 974	-------
Poland	-------	-------	26, 263	753	29, 605	247	49, 041	31	25, 466	2, 439
Portugal	6, 565	279	9, 533	-------	9, 561	-------	-------	-------	-------	-------
Spain	51, 026	-------	71, 200	-------	85, 583	-------	56, 448	-------	25, 758	-------
Sweden	9, 772	1	9, 813	598	12, 598	883	9, 022	157	12, 830	22
Switzerland	17, 949	47	22, 986	-------	4, 281	-------	9, 854	1	12, 795	-------
United Kingdom	117, 956	4, 603	158, 404	8, 682	162, 947	7, 520	176, 598	5, 011	186, 497	3, 853
Total, 37 countries	803, 526	854, 952	961, 500	1, 045, 834	1, 110, 290	1, 246, 902	1, 169, 520	1, 076, 930	978, 089	825, 748

Bureau of Agricultural Economics. Official sources. Tobacco comprises leaf, stems, and strippings, but not snuff.

[1] Sea trade only.
[2] Less than 500 pounds.
[3] Source-L'Economie de L'Union des R. S. S. 1922–23 and 1923–24, European border only; 1924–25 to 1925–26, Statistical Summary, Russia, includes Europe and Asia, year beginning Oct. 1.
[4] 9 months.
[5] 6 months.
[6] Year beginning July 1.
[7] Average for Austria-Hungary.

FARM ANIMALS AND ANIMAL PRODUCTS

TABLE 333.—*All cattle and beef cattle: Number and price to producers in the United States, 1840, 1850, 1860, 1867–1928*

Year	All cattle on farms [1]	All cattle other than milk cows		Beef cattle on farms and elsewhere [3]	Year	All cattle on farms [1]	All cattle other than milk cows		Beef cattle on farms and elsewhere [3]
		On farms [2]	Price per head to producers, Jan. 1				On farms [2]	Price per head to producers, Jan. 1	
	Thousands	*Thousands*	*Dollars*	*Thousands*		*Thousands*	*Thousands*	*Dollars*	*Thousands*
1840, June 1 [4]	*14,972*	-------	-------	-------	1898	45,105	29,264	20.92	38,000
1850, June 1 [4]	*16,078*	*9,693*	-------	-------	1899	43,984	27,994	22.79	37,100
1860, June 1 [4]	*23,365*	*14,779*	-------	-------	1900	[5]43,902	[5]27,610	24.73	37,500
1867	20,080	11,731	15.79	12,600	1900, June 1 [4]	*67,720*	*50,584*	-------	-------
1868	20,634	11,912	15.06	13,600	1900	57,518	41,226	-------	-------
1869	21,433	12,185	18.73	14,800	1901	60,544	43,710	19.93	37,700
1870, June 1 [4]	*22,501*	*13,566*	-------	-------	1902	62,215	45,518	18.76	36,400
1870	25,484	15,368	18.67	20,000	1903	63,788	46,683	18.45	35,600
1871	26,235	16,212	20.78	21,000	1904	64,137	46,717	16.32	33,800
1872	26,694	16,390	18.12	21,100	1905	64,003	46,431	15.15	33,300
1873	26,990	16,414	18.06	20,900	1906	62,872	43,078	15.85	34,800
1874	26,923	16,218	17.55	20,500	1907	62,373	41,405	17.10	37,900
1875	27,220	16,313	16.91	20,400	1908	60,794	39,600	16.89	35,900
1876	27,870	16,785	17.00	20,800	1909	59,634	37,914	17.49	34,400
1877	29,217	17,956	15.99	22,200	1910, Apr. 15 [4]	*61,803*	*41,178*	-------	-------
1878	30,523	19,223	16.72	23,800	1910	57,940	37,315	19.07	32,000
1879	33,234	21,408	15.38	26,400	1911	56,219	35,396	20.54	30,500
1880, June 1 [4]	*34,932*	*22,489*	-------	-------	1912	55,022	34,323	21.20	28,300
1880	33,258	21,231	16.57	25,900	1913	55,833	35,336	26.36	27,400
1881	33,308	20,939	17.33	24,900	1914	58,737	38,000	31.13	27,200
1882	35,892	23,280	19.89	27,600	1915	62,532	41,270	33.38	28,300
1883	41,172	28,046	21.81	33,400	1916	66,394	44,286	33.53	30,900
1884	42,547	29,046	23.52	34,100	1917	69,533	46,639	35.88	32,600
1885	43,772	29,867	23.25	34,400	1918	71,229	47,919	40.88	35,100
1886	45,510	31,275	21.17	35,700	1919	70,261	46,786	44.22	36,200
1887	48,034	33,512	19.79	37,900	1920, Jan. 1 [4]	*66,639*	*46,964*	-------	-------
1888	49,234	34,378	17.79	38,300	1920	68,871	47,444	42.18	35,778
1889	50,331	35,032	17.05	38,300	1921	67,184	45,776	30.60	34,755
1890, June 1 [4]	*50,246*	*33,734*	-------	-------	1922	67,264	45,476	23.15	34,805
1890	52,802	36,849	15.63	39,800	1923	66,156	44,093	24.81	32,291
1891	52,896	36,876	14.76	40,900	1924	64,507	42,252	24.44	30,972
1892	54,067	37,051	15.16	42,000	1925, Jan. 1	*60,760*	*43,115*	-------	-------
1893	52,378	35,054	15.24	40,500	1925	61,996	39,515	23.94	29,415
1894	53,095	36,608	14.66	43,700	1926	59,122	36,934	27.50	27,267
1895	50,869	34,364	14.06	41,700	1927	56,872	35,054	29.87	25,167
1896	48,223	32,085	15.86	39,700	1928	55,696	33,748	38.95	23,373
1897	46,450	30,508	16.65	38,700					

Data for cattle on farms and prices to producers, except as otherwise stated, from records of the Bureau of Agricultural Economics, as of Jan. 1.

[1] Figures 1900–1919 are tentative revised estimates of the Bureau of Agricultural Economics not previously published and are subject to change.

[2] Figures for the period 1900–1928 are obtained by subtracting the estimates of "milk cows on farms" shown on Table 422 from the revised estimates of "all cattle on farms" shown on this table.

[3] Data for beef cattle on farms and elsewhere as of Jan. 1 estimated by the Bureau of Animal Industry are tentative and subject to revision after more extensive research. Census figures were adjusted to a Jan. 1 basis and to include all ages and all animals in towns, villages, and ranges, as well as on farms. For methods, see Department Circular 241, as published in 1922. Some figures revised in a 1926 edition, and additional revisions have been made by the Bureau of Animal Industry for 1920–1928.

[4] Italic figures for census years represent classification of cattle as follows: 1840 reported as "neat cattle", 1880 and 1890 exclude an estimated number of unenumerated cattle on ranges as follows: 1880, 3,750,022; 1890, 6,285,220. No estimate made prior to 1880. Figures for censuses prior to 1900 were nominally exclusive of calves, though some calves may have been included. 1900, 1910, and 1920 include calves. 1850–1890 exclude working oxen as follows: 1850, 1,700,744; 1860, 2,254,911; 1870, 1,319,271; 1880, 993,841; 1890, 1,117,494. Not separately reported after 1890.

[5] Original estimate of the Bureau of Agricultural Economics.

TABLE 334.—*All cattle and calves, including cows and heifers kept for milk: Estimated number on farms and value per head, by States, January 1, 1924–1928*

State	Number Jan. 1—					Value per head Jan. 1—				
	1924	1925	1926	1927	1928 [1]	1924	1925	1926	1927	1928 [1]
	Thousands	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
Maine	245	241	235	233	228	45.60	41.90	51.40	51.70	61.60
New Hampshire	142	125	119	113	113	49.80	47.50	57.30	67.00	85.40
Vermont	429	403	401	403	404	45.40	46.00	56.80	63.20	79.60
Massachusetts	208	195	187	181	178	63.60	63.10	74.20	78.30	106.90
Rhode Island	28	27	27	27	27	75.00	70.40	76.60	85.00	111.80
Connecticut	170	160	151	144	141	66.60	66.10	78.40	84.10	114.00
New York	1,940	1,852	1,824	1,822	1,887	54.70	53.20	68.00	74.00	93.70
New Jersey	160	154	154	157	161	74.50	68.40	85.00	94.80	106.80
Pennsylvania	1,387	1,318	1,298	1,289	1,332	50.70	51.30	60.60	64.70	81.90
Ohio	1,710	1,675	1,616	1,608	1,624	44.50	46.10	51.80	55.20	69.60
Indiana	1,358	1,282	1,282	1,320	1,346	42.90	45.00	49.70	51.10	61.50
Illinois	2,425	2,345	2,251	2,161	1,945	44.20	44.50	51.30	52.50	63.00
Michigan	1,420	1,406	1,420	1,406	1,434	46.10	46.80	50.80	56.60	68.70
Wisconsin	3,039	3,035	3,005	2,960	2,960	46.30	44.40	53.70	60.00	72.70
Minnesota	2,890	2,853	2,853	2,710	2,656	36.70	37.30	43.20	45.60	58.40
Iowa	4,533	4,372	4,241	4,029	3,720	40.30	39.60	44.30	47.00	57.10
Missouri	2,650	2,442	2,369	2,174	2,109	34.60	33.40	36.70	39.30	52.30
North Dakota	1,370	1,341	1,260	1,100	1,034	28.50	28.90	32.80	34.40	47.40
South Dakota	2,147	2,074	1,919	1,635	1,570	31.20	30.60	34.20	37.10	50.30
Nebraska	3,386	3,314	3,191	2,819	2,875	34.30	33.60	37.00	40.50	52.60
Kansas	3,200	3,068	2,853	2,568	2,465	31.10	31.60	35.90	38.90	49.50
Delaware	46	46	48	48	49	48.20	53.50	57.30	65.80	81.80
Maryland	279	273	270	265	275	51.00	50.90	55.60	58.90	74.00
Virginia	847	827	744	707	756	33.20	33.00	33.90	37.00	50.50
West Virginia	600	591	526	473	492	35.60	33.30	36.30	39.50	55.10
North Carolina	562	545	523	507	527	31.20	29.80	31.60	35.60	47.20
South Carolina	362	341	300	300	306	25.90	24.90	25.50	28.50	34.20
Georgia	996	938	854	854	863	17.60	18.30	19.10	22.20	28.90
Florida	740	656	630	592	533	19.80	18.20	20.30	17.00	20.40
Kentucky	970	938	910	946	1,003	28.60	28.70	33.20	37.50	48.60
Tennessee	1,040	1,023	921	912	958	22.40	22.20	25.20	30.50	41.80
Alabama	900	840	739	746	709	16.80	16.30	19.00	21.80	28.30
Mississippi	1,010	938	845	853	879	16.50	15.00	17.60	20.60	29.50
Arkansas	880	837	795	795	817	13.20	16.00	18.90	22.00	30.10
Louisiana	720	720	648	616	579	20.80	19.40	20.10	21.80	28.10
Oklahoma	1,750	1,695	1,610	1,723	1,723	19.50	22.10	27.30	32.20	40.80
Texas	6,550	6,275	5,900	5,841	5,607	20.90	21.90	22.80	28.90	40.10
Montana	1,360	1,340	1,280	1,152	1,117	30.60	30.30	31.80	33.70	50.20
Idaho	705	650	624	605	588	33.10	28.90	38.30	39.80	49.90
Wyoming	825	795	787	771	764	31.30	29.20	34.90	39.90	52.40
Colorado	1,540	1,465	1,377	1,418	1,317	28.30	26.60	32.90	36.30	48.40
New Mexico	1,350	1,290	1,213	1,189	1,070	23.50	22.30	26.30	31.00	42.00
Arizona	1,116	1,069	863	705	546	31.10	26.20	34.90	34.50	42.90
Utah	540	507	482	472	472	33.20	28.00	36.90	40.20	49.10
Nevada	440	419	385	350	343	34.70	25.70	36.40	39.80	50.00
Washington	586	582	558	530	519	48.30	45.40	45.90	52.40	60.30
Oregon	814	796	716	687	680	36.00	35.30	38.60	42.00	52.10
California	2,142	1,918	1,918	1,956	1,995	45.20	43.40	48.20	49.50	54.90
United States	64,507	61,996	59,122	56,872	55,696	34.05	33.63	38.70	42.36	54.12

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

[1] Preliminary.

TABLE 335.—*Cattle: Number in countries having 150,000 or over, average 1909–1913 and 1921–1925, annual 1925–1927*

Country	Month of estimate	Average, 1909–1913 [1]	Average, 1921–1925 [1]	1925	1926	1927
NORTH AND CENTRAL AMERICA AND WEST INDIES		*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
Canada	June	6,551	9,588	9,307	8,571	9,172
United States	January	58,676	65,421	61,996	59,122	56,872
Mexico	June	[2 3] 5,142	2,492	2,925	5,121	
Guatemala	July	557	268	245	564	260
Honduras		411	[4] 466			
Salvador		350				
Nicaragua		[3 5] 252	1,200			
Costa Rica		[3] 333	443	433		
Cuba	December [6]	2,917	4,667	4,630	3,783	
Dominican Republic	May		652			
Porto Rico		[3] 316	178	144		
Total above countries reporting:						
Pre-war to 1926		73,843	82,436	79,103	77,161	
Pre-war to 1927		65,784	75,277	71,548	68,257	66,304
Estimated total [7]		76,000	86,000			
SOUTH AMERICA						
Colombia		4,000	7,468	6,476	6,500	
Venezuela		2,004	2,689			
Ecuador			[8] 1,500		1,280	
Peru	February		1,198			
Bolivia	April	734	1,500		2,145	2,320
Chile		1,780	1,957	1,918		
Brazil [9]	September	30,705	[2 10] 34,271			
Uruguay		[3 5] 8,193	8,117	[11] 8,432		
Paraguay	December [6]	4,422	4,600	[8] 4,300		
Argentina	do. [6]	[3 12] 25,867	[3] 37,065			
Total South American countries reporting:						
Pre-war to 1926		4,000	7,468	6,476	6,500	
Estimated total [7]		80,000	101,000			
EUROPE						
England	June	5,843	5,824	6,163	6,253	6,275
Scotland	do	1,203	1,171	1,205	1,198	1,204
Ireland	do	4,847	4,996	4,659	4,614	4,746
Norway [13]	do	[14] 1,134	1,128	1,151	1,200	1,209
Sweden	do	3,069	2,418	[8] 2,100		
Denmark	July	2,717	2,613	2,758	2,838	2,912
Holland	May June	2,062	2,063			
Belgium	December [6]	1,925	1,550	1,628	1,655	1,712
France	do. [6]	15,338	13,582	14,025	14,373	14,482
Spain	do. [6]	2,587	3,457	3,436	3,794	3,688
Portugal		[3 15] 703	752	768		
Italy [9]	March April	6,590	6,925	[11] 7,000		
Switzerland		[3] 1,443	1,443		1,587	
Germany	December [6]	18,474	16,786	17,326	17,202	17,133
Austria	December–April	2,356	2,224			
Czechoslovakia	December [6]	4,596	4,469		4,691	
Hungary	April	2,150	1,858	1,920	1,847	1,805
Yugoslavia [9]	January	5,155	4,122	3,796	3,738	
Greece [9]		665	701			

[1] Average for 5-year period if available otherwise for any year or years within this period except as otherwise stated. In countries having changed boundaries, the pre-war figures are estimates for 1 year only of numbers within present boundaries. For the pre-war average the years immediately preceding the war have been used.
[2] Year 1902.
[3] Census.
[4] Year 1918.
[5] Year 1908.
[6] Countries reporting as of December have been considered as of Jan. 1 of the following year—i. e., figure for number of cattle in France as of Dec. 31, 1924, has been put in the 1925 column.
[7] This total includes interpolations for a few countries not reporting each year and rough estimates for some others.
[8] Unofficial.
[9] Buffaloes included.
[10] Year 1920.
[11] Year 1924.
[12] June.
[13] In rural communities only.
[14] September.
[15] Year 1906.

TABLE 335.—*Cattle: Number in countries having 150,000 or over, average 1909–1913 and 1921–1925, annual 1925–1927*—Continued

Country	Month of estimate	Average, 1909–1913	Average, 1921–1925	1925	1926	1927
EUROPE—continued		*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
Bulgaria [9]	December [6]	2,048	2,148	1,560		
Rumania [9]	do.[6]	5,648	5,570	5,583	5,219	4,992
Poland		8,351	8,473	8,950		
Lithuania		918	1,149	1,339	1,396	
Latvia	June	912	868	907	955	967
Estonia	Summer	528	508	555	599	634
Finland	September	1,605	1,847	1,871	1,860	
Russia (European)	Summer	[16] 38,545	34,105	42,269	43,058	[17] 43,880
Total European countries reporting:						
Pre-war to 1926		109,529	101,134	110,591	111,799	
Pre-war to 1927		101,851	94,016	103,585	104,805	105,639
Estimated total [7]		141,000	133,000			
AFRICA						
Morocco		[18] 675	1,711	1,955	1,933	
Algeria	March	1,112	849	892	946	849
Tunis	December [6]	195	413	308	370	396
French West Africa		1,500	2,158	2,272	2,313	
French Sudan		1,019	1,086			
Nigeria			2,805	2,864	3,162	
French Cameroon			385	325	332	
Egypt [9]	September	1,316	1,310	1,400	1,485	
Anglo-Egyptian Sudan			864	935	1,500	
Italian Somaliland	February		[3 10] 1,246			
Eritrea		517	506			
Kenya Colony	March–June	754	3,038	3,417	3,413	
Uganda		556	1,109	1,342	1,338	
French Equatorial Africa			822			
Belgian Congo		500	495	480	465	
Portuguese East Africa			270			
British Southwest Africa		206	561	572	621	
Bechuanaland		[3] 324	[3] 495	502	518	
Union of South Africa	April–May	[3] 5,797	9,342	9,738		
Basutoland		[3] 437	604	631	645	
Rhodesia:						
Northern	December [6]	255	289	386	382	363
Southern	do.[6]	509	1,794	2,009	2,102	2,189
Swaziland		60	244			
Tanganyika Territory		1,489	3,806	4,472	4,472	
Madagascar	February	4,890	7,624	7,659		
Total African countries reporting:						
Pre-war to 1926		9,828	18,632	20,638	21,003	
Pre-war to 1927		2,071	3,345	3,595	3,800	3,797
Estimated total [7]		27,000	46,000			
ASIA						
Turkey, European and Asiatic		6,438	4,265	4,622	4,947	
Persia			[8] 1,000			
Syria [9]			257	280	243	
India: [9]						
British	December–April	128,451	146,759	150,978	150,832	
Native States	do	13,258	33,982	36,254		
Ceylon [9]	December [6]	1,484	1,459		1,457	1,537
Russia (Asiatic)	Summer	[19] 13,578	[20] 10,996	[21] 14,608	[21] 15,445	[21] 16,017
China		21,997				

[3] Census.
[6] Countries reporting as of December have been considered as of Jan. 1 of the following year—i. e., figure for number of cattle in France as of Dec. 31, 1924, has been put in the 1925 column.
[7] This total includes interpolations for a few countries not reporting each year and rough estimates for some others.
[8] Unofficial.
[9] Buffaloes included.
[10] Year 1920.
[16] Year 1916.
[17] No estimate for Crimea, so have included the 1926 estimate for that territory. Exclusive of Crimea the number is 43,633,400.
[18] Year 1915.
[19] Year 1916. The 1920 census figures for Turkestan and Azerbaijan (part of Transcaucasia) have been included as no estimte was made for these regions in 1916.
[20] Includes estimated number in Turkestan and Azerbaijan (part of Transcaucasia) according to census of 1920 with the estimates for the years 1921, 1922, and 1923, and the estimated number in Turkestan, Transcaucasia, and Kazak-Kirghiz in 1924 with the year 1925.
[21] Includes 7,170,900 cattle in Turkestan, Kazak-Kirghiz, and Transcaucasia in 1924. The number in Siberia and the Far East only was as follows: 1925, 7,436,800; 1926, 8,273,900; 1927, 8,846,200.

TABLE 335.—*Cattle: Number in countries having 150,000 or over, average 1909–1913 and 1921–1925, annual 1925–1927*—Continued

Country	Month of estimate	Average, 1909–1913	Average, 1921–1925	1925	1926	1927
ASIA—continued.		*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
Japan	December [6]	1, 385	1, 440	1, 456	1, 460	----------
Chosen	do	966	1, 567	1, 605	1, 591	1, 595
Formosa [9]	do	473	407	383	379	----------
French-Indo China [9]		[16] 4, 616	3, 390	3, 643	----------	----------
Siam [9]	March	4, 501	6, 701	8, 003	8, 230	----------
Philippine Islands [9]	December [6]	1, 190	2, 418	2, 681	2, 683	----------
Dutch East Indies:						
Java and Madura [9]	do	5, 091	5, 289	5, 656	5, 721	----------
Outer possessions [9]	do	1, 640	1, 872	1, 991	1, 965	----------
Total Asiatic countries reporting:						
Pre-war to 1926		163, 713	181, 714	191, 983	193, 253	----------
Pre-war to 1927		14, 544	12, 543	16, 213	17, 036	17, 612
Estimated total [7]		208, 000	246, 000	----------	----------	----------
OCEANIA						
Australia	December [6]	11, 535	13, 789	13, 309	13, 280	----------
New Zealand	January	[3] 2, 020	3, 393	3, 470	3, 452	3, 242
Total Oceanic countries reporting:						
Pre-war to 1926		13, 555	17, 182	16, 779	16, 732	----------
Pre-war to 1927		2, 020	3, 393	3, 470	3, 452	3, 242
Estimated total [7]		14, 000	17, 000	----------	----------	----------
World total countries reporting:						
Pre-war to 1926		374, 468	408, 566	425, 570	426, 448	----------
Pre-war to 1927		186, 270	188, 574	198, 411	197, 350	196, 594
Estimated total [7]		546, 000	629, 000	----------	----------	----------

Bureau of Agricultural Economics. Compiled from official sources and the International Institute of Agriculture unless otherwise stated.

[3] Census.

[6] Countries reporting as of December have been considered as of Jan. 1 of the following year—i. e., figure for number of cattle in France as of Dec. 31, 1924, has been put in the 1925 column.

[7] This total includes interpolations for a few countries not reporting each year and rough estimates for some others.
[9] Buffaloes included.
[16] Year 1916.

TABLE 336.—*Cattle and calves: Receipts at principal public stockyards and at all public stockyards, 1909–1927*

Year	Chicago	Denver	East St. Louis	Fort Worth	Kansas City	Omaha	South St. Joseph	South St. Paul	Sioux City	Total nine markets [1]	All other stockyards reporting [2]	Total all stockyards reporting [2]
	Thousands	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
1909	3, 340	426	1, 241	1, 197	2, 660	1, 125	592	497	426	11, 504	--------	--------
1910	3, 553	399	1, 208	1, 071	2, 507	1, 224	565	604	439	11, 570	--------	--------
1911	3, 453	298	1, 072	884	2, 370	1, 174	513	539	487	10, 790	--------	--------
1912	3, 158	416	1, 200	1, 039	2, 147	1, 017	494	524	431	10, 426	--------	--------
1913	2, 888	499	1, 100	1, 185	2, 319	962	450	532	394	10, 329	--------	--------
1914	2, 601	443	1, 041	1, 176	1, 957	939	356	585	368	9, 466	--------	--------
1915	2, 685	424	992	944	1, 963	1, 218	441	856	534	10, 057	4, 496	14, 553
1916	3, 250	601	1, 200	1, 081	2, 331	1, 434	480	941	602	11, 920	5, 756	17, 676
1917	3, 820	653	1, 405	1, 960	2, 902	1, 720	670	1, 197	707	15, 034	8, 032	23, 066
1918	4, 448	728	1, 509	1, 665	3, 320	1, 993	870	1, 430	818	16, 781	8, 514	25, 295
1919	4, 253	824	1, 473	1, 267	3, 085	1, 975	750	1, 491	814	15, 932	8, 697	24, 629
1920	3, 849	617	1, 254	1, 134	2, 500	1, 603	643	1, 373	752	13, 725	8, 472	22, 197
1921	3, 540	482	1, 077	984	2, 469	1, 435	558	985	620	12, 150	7, 637	19, 787
1922	3, 934	656	1, 400	1, 084	2, 983	1, 744	655	1, 387	747	14, 590	8, 628	23, 218
1923	3, 918	620	1, 399	1, 258	3, 208	1, 793	709	1, 349	759	15, 013	8, 198	23, 211
1924	3, 997	630	1, 385	1, 392	3, 043	1, 863	720	1, 323	836	15, 189	8, 506	23, 695
1925	3, 871	587	1, 444	1, 370	2, 958	1, 709	734	1, 636	897	15, 206	8, 861	24, 067
1926	4, 012	529	1, 526	1, 185	2, 617	1, 815	679	1, 910	969	15, 242	8, 630	23, 872
1927	3, 583	640	1, 448	1, 286	2, 470	1, 561	641	1, 582	809	14, 020	8, 743	22, 763

Bureau of Agricultural Economics. Prior to 1915 figures compiled from yearbooks of stockyard companies; subsequent figures compiled from data of the livestock and meat reporting service of the bureau. Receipts 1900–1908 are available in 1924 Yearbook, p. 840, Table 435.

[1] Total of the rounded detail figures.
[2] Totals for all stockyards not available prior to 1915.

Table 337.—*Cattle and calves: Receipts and stocker and feeder shipments at all public stockyards, 1915–1927*

RECEIPTS, CATTLE

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
	Thousands	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
1915	906	664	849	766	875	897	858	1,083	1,355	1,630	1,535	1,024	12,442
1916	1,043	892	976	862	1,078	1,051	948	1,346	1,548	2,134	1,716	1,257	14,851
1917	1,456	1,092	1,069	1,205	1,581	1,454	1,415	1,513	2,044	2,657	2,308	1,670	19,464
1918	1,500	1,284	1,408	1,634	1,432	1,450	1,730	1,697	2,411	2,484	2,340	1,871	21,241
1919	1,795	1,208	1,179	1,318	1,382	1,195	1,511	1,618	1,978	2,526	2,293	1,816	19,819
1920	1,514	1,147	1,207	1,090	1,303	1,343	1,203	1,458	1,789	1,744	1,978	1,084	16,860
1921	1,256	871	1,114	1,043	1,065	1,095	893	1,375	1,361	1,754	1,447	1,036	14,310
1922	1,222	1,044	1,145	1,009	1,358	1,217	1,255	1,608	1,802	2,243	1,846	1,392	17,141
1923	1,395	1,038	1,044	1,159	1,305	1,138	1,357	1,622	1,782	2,141	1,650	1,368	16,999
1924	1,388	1,041	1,084	1,161	1,317	1,172	1,254	1,398	1,938	2,096	1,796	1,528	17,173
1925	1,353	1,056	1,273	1,201	1,139	1,160	1,398	1,632	1,592	2,126	1,717	1,470	17,117
1926	1,314	1,065	1,233	1,146	1,277	1,279	1,279	1,421	1,827	2,030	1,836	1,327	17,034
1927	1,327	1,080	1,172	1,107	1,348	1,185	1,089	1,494	1,482	2,008	1,749	1,217	16,258

RECEIPTS, CALVES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1915	123	103	168	221	236	216	181	164	176	188	189	146	2,111
1916	159	162	225	289	307	269	206	238	230	275	261	203	2,824
1917	240	210	260	335	381	305	313	302	313	397	317	229	3,602
1918	228	214	305	411	431	365	398	327	415	381	308	271	4,054
1919	325	245	337	455	454	392	505	421	418	482	410	366	4,810
1920	366	333	456	467	475	536	467	504	506	466	450	311	5,337
1921	388	319	452	450	477	485	451	492	545	557	481	380	5,477
1922	406	372	477	461	520	542	456	541	595	693	581	433	6,077
1923	482	339	458	511	595	492	546	592	512	661	532	442	6,212
1924	500	415	472	590	574	502	544	536	628	640	567	555	6,523
1925	516	473	588	626	597	586	572	612	566	663	565	586	6,950
1926	526	486	578	564	616	592	541	576	570	644	625	519	6,837
1927	504	476	571	567	607	547	457	571	507	627	598	473	6,505

STOCKER AND FEEDER SHIPMENTS, CATTLE

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1915	144	81	129	139	91	73	86	164	349	440	350	195	2,241
1916	211	193	241	255	280	258	167	322	448	653	434	245	3,707
1917	255	207	237	297	393	344	254	323	576	750	709	338	4,683
1918	215	206	306	377	481	386	268	410	588	674	598	355	4,864
1919	353	256	265	378	431	264	227	384	598	815	703	456	5,130
1920	336	230	230	233	311	262	214	308	480	563	540	274	3,981
1921	200	162	228	232	207	203	119	341	375	580	449	230	3,326
1922	223	234	266	223	338	243	216	453	595	792	630	331	4,544
1923	262	199	186	221	288	220	212	459	608	734	577	338	4,304
1924	231	165	167	230	267	191	161	293	556	724	497	288	3,770
1925	194	163	213	254	198	143	234	347	409	681	449	308	3,593
1926	207	164	171	190	201	158	188	240	495	648	521	273	3,456
1927	187	162	182	184	215	157	128	252	385	626	548	278	3,304

STOCKER AND FEEDER SHIPMENTS, CALVES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1915	3	1	2	3	3	3	2	4	8	14	11	6	60
1916	10	4	9	7	8	6	5	8	16	29	27	11	140
1917	5	6	12	9	8	9	7	8	12	21	20	6	123
1918	7	8	13	8	10	7	6	8	16	30	25	11	149
1919	11	8	12	12	12	8	9	12	14	24	20	14	156
1920	12	10	11	12	11	10	5	6	8	17	13	6	121
1921	5	4	8	6	7	6	3	14	19	42	48	16	178
1922	10	9	16	11	21	17	7	16	35	72	80	26	320
1923	19	12	13	11	12	14	11	21	23	51	47	15	249
1924	11	5	8	9	8	10	9	13	24	39	51	21	208
1925	12	13	17	17	18	11	9	13	18	37	40	25	230
1926	18	13	13	13	17	11	11	12	26	45	49	28	256
1927	18	13	18	20	21	13	10	19	22	49	67	41	311

Bureau of Agricultural Economics. Compiled from data of the livestock and meat reporting service of the bureau.

TABLE 338.—*Cattle and calves: Receipts, local slaughter, and stocker and feeder shipments from public stockyards, 1924–1927*

Market	Receipts				Local slaughter				Stocker and feeder shipments			
	1924	1925	1926	1927	1924	1925	1926	1927	1924	1925	1926	1927
	Thousands	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
Albany, N. Y	13	10	11	7	1	1	1	1	(1)	(1)	(1)	(1)
Amarillo, Tex	130	163	120	172	0	(1)	1	(1)	87	132	87	138
Atlanta, Ga	50	55	56	97	29	29	29	36	2	1	0	(1)
Augusta, Ga	9	9	9	8	7	8	5	7	2	2	1	1
Baltimore, Md	233	247	247	240	165	168	172	147	5	7	7	4
Boston, Mass	101	127	108	107	0	0	0	0	0	0	0	0
Buffalo, N. Y	550	599	594	611	199	212	215	200	12	13	8	7
Chattanooga, Tenn	15	15	14	12	11	13	13	11	4	2	1	1
Cheyenne, Wyo	15	10	9	16	0	0	0	0	0	0	0	0
Chicago, Ill	3,997	3,871	4,012	3,583	2,890	2,869	2,951	2,645	258	231	240	169
Cincinnati, Ohio	442	432	413	403	242	246	248	241	21	21	19	19
Cleveland, Ohio	285	293	260	228	256	264	241	220	5	2	1	(1)
Dallas, Tex	7	12	12	10	7	12	12	10	0	0	0	0
Dayton, Ohio	34	34	34	34	30	30	31	29	0	0	0	0
Denver, Colo	630	587	529	640	159	175	159	159	359	289	303	331
Detroit, Mich	283	303	306	296	248	232	263	245	10	6	5	3
East. Louis, Ill	1,385	1,444	1,526	1,448	544	550	533	483	199	143	112	99
El Paso, Tex	142	177	166	136	30	31	28	33	59	85	113	97
Evansville, Ind	36	42	52	65	21	17	20	49	3	4	5	8
Fort Wayne, Ind	14	18	19	21	4	4	7	9	(1)	(1)	(1)	6
Fort Worth, Tex	1,302	1,370	1,185	1,286	972	987	761	841	158	191	222	259
Fostoria, Ohio	11	12	9	7	1	1	2	2	4	2	1	0
Indianapolis, Ind	560	547	541	489	269	246	295	282	48	45	39	25
Jacksonville, Fla	5	7	9	31	4	5	8	14	0	(1)	(1)	15
Jersey City, N. J	711	745	708	643	711	745	708	643	0	0	0	0
Kansas City, Mo	3,043	2,958	2,617	2,470	1,552	1,631	1,459	1,336	998	908	761	756
Knoxville, Tenn	25	27	20	23	13	15	17	17	2	4	3	6
La Fayette, Ind	14	16	17	15	8	8	9	8	(1)	(1)	1	1
Lancaster, Pa	223	233	236	217	45	53	55	74	63	82	74	79
Laredo, Tex	12	16	14	12	3	3	5	4	6	10	3	4
Los Angeles, Calif	252	247	268	258	242	235	256	241	9	11	11	16
Louisville, Ky	231	240	215	230	93	103	102	96	22	24	18	27
Marion, Ohio	6	5	5	4	2	2	1	1	(1)	(1)	(1)	(1)
Memphis, Tenn	19	24	48	107	11	17	26	39	5	4	11	14
Milwaukee, Wis	532	588	640	623	494	547	587	583	14	11	10	7
Montgomery, Ala	77	73	94	153	10	6	8	9	10	6	9	16
Moultrie, Ga	7	6	8	15	4	4	5	9	(1)	1	1	2
Muncie, Ind	0	15	18	18	0	5	5	6	0	1	1	1
Nashville, Tenn	100	116	109	91	51	56	57	56	10	11	9	9
Newark, N. J	46	41	42	41	43	37	38	38	3	4	3	3
New Orleans, La	212	205	202	185	178	173	166	153	11	10	12	14
New York, N. Y	218	222	227	224	217	222	226	224	0	0	0	0
North Salt Lake, Utah	99	100	90	61	36	40	39	15	9	12	4	5
Ogden, Utah	155	163	164	164	14	10	13	15	59	64	64	65
Oklahoma City, Okla	388	404	340	383	290	306	249	275	46	58	48	66
Omaha, Nebr	1,863	1,709	1,815	1,561	1,104	1,080	1,165	1,012	467	383	392	346
Pasco, Wash	5	7	4	5	(1)	0	0	0	0	(1)	0	0
Peoria, Ill	46	56	70	77	18	17	19	20	7	6	6	8
Philadelphia, Pa	192	188	183	160	189	185	180	158	0	0	0	0
Pittsburgh, Pa	909	887	918	838	172	179	175	165	0	0	0	0
Portland, Oreg	175	176	164	148	106	112	102	89	10	10	7	5
Pueblo, Colo	108	112	96	127	1	1	2	2	41	45	37	37
Richmond, Va	33	39	37	34	25	27	25	20	2	1	1	2
South St. Joseph, Mo	720	734	679	641	469	529	494	476	142	118	103	107
South St. Paul, Minn	1,323	1,636	1,910	1,582	928	1,152	1,294	1,142	272	322	418	316
South San Francisco, Calif	------	------	------	75	------	------	------	54	------	------	------	(1)
San Antonio, Tex	183	167	145	158	60	57	66	67	63	53	23	42
Seattle, Wash	64	57	64	60	62	56	63	58	0	(1)	0	0
Sioux City, Iowa	836	897	969	809	402	485	522	450	264	260	317	250
Sioux Falls, S. Dak	14	24	36	35	5	10	13	15	7	12	20	19
Spokane, Wash	55	60	55	59	28	35	32	32	13	12	10	11
Springfield, Ill	------	------	------	9	------	------	------	3	------	------	------	(1)
Springfield, Mo	------	------	------	31	------	------	------	9	------	------	------	3
Springfield, Ohio	9	13	14	10	3	2	2	5	0	2	2	0
Toledo, Ohio	25	24	28	20	13	11	17	12	4	3	7	5
Washington, D. C	33	36	32	29	32	37	32	29	0	0	0	0
Wichita, Kans	389	417	330	405	125	139	121	135	183	199	162	187
Discontinued [2]	4	(1)	0	6	2	(1)	0	1	(1)	0	0	4
Total	23,695	24,067	23,872	22,763	13,850	14,462	14,350	13,460	3,978	3,823	3,712	3,615

Bureau of Agricultural Economics. Compiled from data of the livestock and meat reporting service of the bureau. Early data in 1925 Yearbook, pp. 1042–1044. Local slaughter represents number driven out from public stockyards for local slaughter.

[1] Not over 500.
[2] Includes only those markets which have been totally discontinued.

TABLE 339.—*Feeder cattle: Inspected shipments from public stockyards, by months, 1927*

Origin and destination	January	February	March	April	May	June	July	August	September	October	November	December	Total
	Number	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*
Market origin:													
Chicago, Ill.	10, 809	11, 754	10, 439	8, 726	8, 468	6, 486	4, 808	10, 710	18, 673	30, 543	30, 130	15, 647	167, 193
Denver, Colo.	28, 531	11, 119	14, 816	11, 520	30, 523	21, 335	3, 984	9, 324	18, 374	67, 591	83, 045	27, 836	327, 998
East St. Louis, Ill.	5. 493	4, 067	4, 874	4, 643	4, 226	4, 577	4, 504	12, 145	13, 281	20, 660	14, 017	4, 709	97, 196
Fort Worth, Tex.	12, 927	11, 092	18, 129	29, 670	24. 191	19, 233	16, 695	20, 516	23, 898	32, 585	41, 467	22, 075	272, 478
Indianapolis, Ind.	1, 650	1, 827	2, 029	1, 817	2, 009	1, 842	1, 881	2, 574	3, 915	4, 206	2, 721	2, 218	28, 689
Kansas City, Kans.	43, 203	33, 470	39, 785	34, 281	34, 074	22, 789	26, 002	66, 322	83, 457	143, 609	96, 108	47, 807	670, 907
Louisville, Ky.	1, 170	1, 823	2, 921	3, 324	3, 035	3, 275	1, 825	1, 837	2, 919	5, 909	3, 375	2, 072	33, 485
Oklahoma City, Okla.	5, 883	3, 986	7, 480	5, 535	5, 566	6, 294	5, 352	6, 369	9, 209	15, 115	10, 079	8, 510	89, 378
Omaha, Nebr.	20, 264	19, 552	19, 260	10, 142	9, 465	5, 683	4, 689	24, 126	47, 609	78. 189	54, 845	35, 489	329. 313
Sioux City, Iowa	15, 756	13, 669	12, 587	9, 122	9, 297	8, 503	8, 295	17, 664	32, 659	57, 191	31, 226	21, 399	237, 368
South St. Joseph, Mo.	2, 869	2, 493	1, 997	1, 885	1, 613	2, 468	1, 977	5, 574	7, 822	11, 942	6, 320	4, 089	51, 049
South St. Paul, Minn.	12, 208	12, 028	11, 452	7, 414	5, 734	7, 407	11, 207	21, 381	27, 507	39, 852	34, 179	13, 041	203, 410
Wichita, Kans.	14, 365	11, 476	16, 627	26, 684	11. 548	4, 799	5, 147	14, 399	12, 763	23, 103	34, 101	22, 643	197, 655
All other inspected	12, 155	11, 803	13, 078	17, 367	22, 488	18, 911	20, 338	25, 314	28, 454	36, 285	38, 880	22, 884	267, 957
Total	187, 283	150, 159	175, 474	172, 130	172, 237	133, 602	116, 704	238, 255	330, 540	566, 780	480, 493	250, 419	2, 974, 076
State destination:													
Colorado	10, 915	6, 653	8, 318	7, 011	9, 545	12, 425	3, 606	6, 872	11, 008	34, 644	50, 732	17, 826	179. 555
Illinois	17, 727	13, 566	15, 305	10, 548	9. 178	10, 555	11, 289	24, 927	34, 755	67, 686	54, 966	19, 696	290, 198
Indiana	6, 080	5, 536	6, 394	6, 789	6, 210	4, 497	7, 145	25, 217	19, 465	23, 798	18, 188	7, 170	136, 489
Iowa	33. 409	27, 484	26, 467	17. 624	16, 062	17, 174	14, 935	25. 487	58, 342	98, 161	63, 205	32, 900	431, 250
Kansas	32, 393	23, 008	30, 815	48, 327	26, 326	11, 529	13, 032	34, 241	35, 568	59, 701	63. 788	44, 326	423, 054
Kentucky	3, 806	4, 205	7, 374	8, 957	7, 594	9, 693	8, 362	9, 288	8. 180	9, 405	5, 560	3, 720	86, 144
Michigan	753	1, 143	1, 576	2, 273	2, 870	3, 462	2, 742	3, 444	3, 197	5, 442	5, 945	2, 709	35, 556
Minnesota	508	777	1, 186	445	1, 256	1, 388	1, 758	2, 350	3, 451	6, 712	3, 931	856	24, 618
Missouri	18, 845	14, 489	16, 758	14, 133	12, 516	8, 736	6, 560	23, 632	37, 414	62, 207	35, 374	15, 850	266, 514
Nebraska	26, 887	22, 343	20, 796	14, 018	28, 108	9, 403	7, 468	21, 955	45, 363	77, 744	68, 185	43, 930	386, 200
Ohio	2, 922	3, 300	3. 023	3, 805	4, 141	5, 095	6, 288	13. 070	15, 270	17, 232	13, 499	5, 063	92, 708
Oklahoma	9, 598	7, 376	10, 444	16, 347	14. 501	10, 556	7, 414	13, 758	15, 322	24, 221	22, 925	18, 044	170, 506
Pennsylvania	888	567	425	416	1, 186	1, 510	1, 795	5, 130	4, 347	5, 830	6. 019	3, 290	31, 403
South Dakota	2, 019	2. 067	2, 005	542	4, 433	4, 712	2, 472	3, 329	5. 111	12, 346	6, 873	3, 876	49, 785
Texas	13, 278	9, 006	11, 849	9, 921	8, 289	7, 154	13, 002	13, 411	15, 252	20, 625	25. 062	12, 734	159, 583
Wisconsin	307	658	818	884	1, 951	1, 186	600	774	528	1, 688	2, 090	580	12, 064
All other	6, 948	7, 981	11, 921	10, 090	18, 071	14, 527	8, 236	11, 370	17, 967	39, 338	34, 151	17, 849	198, 449
Total	187, 283	150, 159	175, 474	172, 130	172, 237	133, 602	116, 704	238, 255	330, 540	566, 780	480, 493	250, 419	2, 974, 076

Bureau of Agricultural Economics. Compiled from Bureau of Animal Industry inspection records.

TABLE 340.—*Feeder cattle: Inspected shipments from public stockyards, 1920–1927*

Origin and destination	1920	1921	1922	1923	1924	1925	1926	1927
Market origin:	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*
Chicago, Ill	338, 646	331, 193	331, 773	275, 102	245, 880	229, 953	245, 124	167, 193
Denver, Colo	349, 641	237, 247	344, 326	347, 275	346, 093	280, 744	288, 048	327, 998
East St. Louis, Ill	119, 273	128, 985	184, 124	170, 079	136, 198	112, 955	110, 366	97, 196
Fort Worth, Tex	308, 693	153, 318	208, 580	162, 324	160, 140	195, 935	232, 767	272, 478
Indianapolis, Ind	64, 192	50, 908	44, 383	59, 161	48, 665	55, 440	43, 930	28, 689
Kansas City, Kans	751, 463	707, 613	1, 106, 022	1, 138, 407	900, 873	824, 868	705, 975	670, 907
Louisville, Ky	27, 586	37, 177	41, 482	32, 976	21, 537	27, 138	18, 706	33, 485
Oklahoma City, Okla	120, 465	93, 471	91, 382	77, 174	55, 951	78, 493	69, 411	89, 378
Omaha, Nebr	474, 946	396, 248	566, 354	544, 541	476, 064	390, 109	378, 652	329, 313
Sioux City, Iowa	218, 823	213, 681	288, 831	281, 369	248, 635	246, 878	300, 268	237, 368
South St. Joseph, Mo	61, 930	64, 332	103, 621	96, 531	84, 736	70, 930	55, 830	51, 049
South St. Paul, Minn	159, 174	144, 397	305, 963	222, 527	172, 893	207, 599	290, 600	203, 410
Wichita, Kans	109, 376	128, 276	197, 911	197, 606	192, 722	199, 534	152, 100	197, 655
All other inspected	180, 530	140, 629	224, 108	193, 842	185, 271	177, 468	195, 528	267, 957
Total	3, 284, 738	2, 827, 475	4, 038, 860	3, 798, 914	3, 275, 658	3, 098, 044	3, 087, 305	2, 974, 076
State destination:								
Colorado	140, 992	96, 104	126, 360	158, 979	165, 513	130, 830	168, 541	179, 555
Illinois	293, 508	330, 496	545, 916	500, 136	438, 817	437, 349	435, 129	290, 198
Indiana	133, 415	136, 227	150, 836	148, 638	136, 921	150, 139	167, 490	136, 489
Iowa	471, 091	467, 858	840, 711	742, 236	570, 040	487, 334	577, 426	431, 250
Kansas	439, 778	335, 878	510, 797	511, 454	473, 431	467, 713	377, 651	423, 054
Kentucky	43, 824	59, 703	54, 121	49, 222	25, 115	40, 789	43, 400	86, 144
Michigan	54, 603	53, 197	50, 212	46, 027	46, 829	48, 678	41, 413	35, 556
Minnesota	34, 989	24, 983	17, 643	21, 504	30, 668	35, 952	31, 639	24, 618
Missouri	309, 600	311, 549	395, 438	418, 404	285, 497	276, 836	254, 721	266, 514
Nebraska	360, 187	378, 121	659, 480	648, 248	565, 373	426, 470	374, 496	386, 200
Ohio	102, 426	115, 119	122, 939	112, 602	89, 817	97, 003	101, 781	92, 708
Oklahoma	186, 076	151, 775	150, 948	114, 991	107, 515	167, 850	158, 688	170, 506
Pennsylvania	36, 283	38, 582	40, 774	27, 443	21, 090	31, 094	29, 519	31, 403
South Dakota	53, 505	48, 064	62, 606	69, 583	57, 104	38, 315	32, 444	49, 785
Texas	307, 253	105, 016	110, 873	95, 349	127, 506	116, 333	151, 304	159, 583
Wisconsin	42, 308	35, 491	30, 130	22, 492	22, 947	26, 156	29, 054	12, 064
All other	274, 900	139, 312	169, 076	111, 603	108, 475	119, 201	112, 569	198, 449
Total [1]	3, 284, 738	2, 827, 475	4, 038, 860	3, 798, 914	3, 275, 658	3, 098, 044	3, 087, 305	2, 974, 076

Bureau of Agricultural Economics. Compiled from Bureau of Animal Industry inspection records.

[1] Includes 2 head shipped to Alaska in 1925 and 10 head in 1926.

TABLE 341.—*Cattle, beef: Estimated price per 100 pounds received by producers in the United States, 1910–1927*

Year beginning August	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Weighted av.
Average:	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1910–1913	5. 08	5. 09	5. 09	5. 01	5. 03	5. 12	5. 22	5. 39	5. 55	5. 57	5. 50	5. 45	5. 24
1914–1920	7. 92	7. 76	7. 53	7. 35	7. 26	7. 43	7. 55	7. 83	8. 14	8. 25	8. 19	7. 93	7. 74
1921–1925	5. 75	5. 58	5. 52	5. 36	5. 34	5. 52	5. 64	5. 91	6. 07	6. 09	6. 09	6. 03	5. 72
1910	4. 64	4. 65	4. 64	4. 48	4. 45	4. 53	4. 57	4. 66	4. 67	4. 59	4. 43	4. 28	4. 55
1911	4. 39	4. 43	4. 32	4. 36	4. 37	4. 46	4. 61	4. 75	5. 15	5. 36	5. 23	5. 17	4. 69
1912	5. 37	5. 35	5. 36	5. 22	5. 33	5. 40	5. 55	5. 88	6. 08	6. 01	6. 02	5. 98	5. 60
1913	5. 91	5. 92	6. 05	5. 99	5. 96	6. 04	6. 16	6. 28	6. 29	6. 33	6. 32	6. 38	6. 12
1914	6. 47	6. 38	6. 23	6 02	6. 01	5. 99	5. 93	5. 92	5. 96	6. 13	6. 20	6. 07	6. 12
1915	6. 18	6. 06	6. 04	5. 85	5. 75	5. 85	5. 99	6. 37	6. 66	6. 73	6. 91	6. 78	6. 24
1916	6. 51	6. 55	6. 37	6. 44	6. 56	6. 86	7. 36	7. 91	8. 57	8. 70	8. 65	8. 30	7. 31
1917	8. 17	8. 40	8. 35	8. 21	8. 24	8. 33	8 55	8. 85	9. 73	10. 38	10 40	10. 07	8. 92
1918	9. 71	9. 63	9. 33	9. 14	9. 28	9. 65	10. 02	10. 34	10. 81	10. 84	10. 20	9. 96	9. 85
1919	9. 82	9. 02	8. 65	8. 65	8. 63	8. 99	8. 98	9. 08	9. 20	8. 97	9. 32	8. 93	9. 00
1920	8. 56	8. 29	7. 77	7. 15	6. 36	6. 22	6. 02	6. 36	6. 08	5. 98	5. 65	5. 40	6. 76
1921	5. 39	4. 98	4. 81	4. 69	4. 62	4. 75	5. 07	5. 46	5. 53	5. 70	5. 84	5. 76	5. 18
1922	5. 51	5. 44	5. 48	5. 29	5. 28	5. 51	5. 55	5. 62	5. 78	5. 77	5. 82	5. 72	5. 55
1923	5. 60	5. 70	5. 48	5. 23	5. 26	5. 38	5. 47	5. 63	5. 82	5. 94	5. 79	5. 65	5. 57
1924	5. 67	5. 53	5. 52	5. 43	5. 35	5. 63	5. 69	6. 18	6. 55	6. 48	6. 46	6. 55	5. 88
1925	6. 58	6. 27	6. 29	6. 14	6. 18	6. 31	6. 42	6. 65	6. 66	6. 57	6. 56	6. 46	6. 40
1926	6. 29	6. 48	6. 43	6. 32	6. 42	6. 45	6. 60	6. 82	7. 13	7. 17	7. 08	7. 13	6. 67
1927	7. 21	7. 42	7. 55	8. 00	8. 32	-----	-----	-----	-----	-----	-----	-----	-----

Bureau of Agricultural Economics. Based on reports of special price reporters.

TABLE 342.—*Calves, veal: Estimated price per 100 pounds received by producers in the United States, 1910–1927*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Weighted av.
Average:	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1910–1913	6.51	6.49	6.67	6.52	6.34	6.54	6.48	6.59	6.78	6.80	6.74	6.74	6.60
1914–1920	9.83	9.96	10.06	10.10	9.85	10.02	10.30	10.32	10.51	10.35	10.01	9.89	10.11
1921–1925	8.30	8.53	8.55	7.98	7.80	7.77	7.88	7.94	8.25	8.38	8.00	7.94	8.09
1910	6.41	6.28	6.59	6.54	6.30	6.57	6.37	6.29	6.43	6.41	6.39	6.38	6.42
1911	6.50	6.38	6.48	5.96	5.68	5.72	5.74	5.93	6.11	6.15	6.10	5.98	6.04
1912	6.06	6.07	6.11	6.22	6.23	6.33	6.33	6.62	6.83	6.90	6.77	6.88	6.45
1913	7.06	7.23	7.49	7.38	7.17	7.53	7.46	7.53	7.73	7.72	7.70	7.74	7.48
1914	7.89	7.90	7.92	7.68	7.59	7.69	7.80	8.08	8.06	7.97	7.78	7.61	7.83
1915	7.66	7.62	7.50	7.31	7.35	7.53	7.87	7.75	7.80	7.91	7.69	7.61	7.63
1916	7.67	7.87	8.11	8.00	8.08	8.39	8.54	8.59	8.77	8.59	8.60	8.79	8.35
1917	9.15	9.88	9.94	10.49	10.48	10.60	10.77	10.56	11.08	11.10	10.66	10.98	10.51
1918	11.16	11.17	11.33	11.71	11.62	11.88	12.33	12.22	12.57	12.35	11.94	12.31	11.91
1919	12.39	12.18	12.65	12.78	12.11	12.40	13.38	13.43	13.39	12.87	12.65	12.67	12.76
1920	12.89	13.12	12.98	12.72	11.69	11.68	11.44	11.64	11.88	11.64	10.77	9.27	11.80
1921	9.34	9.08	9.05	7.73	7.55	7.43	7.37	7.31	7.67	7.61	7.20	7.14	7.81
1922	7.23	7.84	7.85	7.26	7.28	7.67	7.49	7.67	8.10	8.17	7.92	7.78	7.68
1923	8.05	8.37	8.20	7.78	7.69	7.66	8.00	8.00	8.34	8.37	7.85	7.75	7.99
1924	8.36	8.51	8.43	8.33	8.14	7.91	7.88	7.94	8.09	8.22	7.89	7.84	8.12
1925	8.50	8.87	9.21	8.80	8.35	8.18	8.65	8.80	9.07	9.52	9.16	9.17	8.85
1926	9.44	9.86	9.75	9.45	8.92	9.65	9.47	9.54	10.06	10.29	9.54	9.44	9.61
1927	9.75	10.10	10.10	9.90	9.37	9.46	9.82	10.37	10.78	11.04	10.67	10.71	10.16

Bureau of Agricultural Economics. Based on reports of special price reporters.

TABLE 343.—*Cattle, choice steers for chilled beef: Average price per 100 pounds, by months, Buenos Aires, 1909–1927*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
Averages:	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1909–1913	3.54	3.58	3.72	3.82	3.89	3.90	4.02	4.19	4.34	4.51	4.41	4.00	3.99
1914–1920	6.52	6.59	6.61	6.65	6.50	6.37	6.68	7.07	7.41	7.50	6.93	6.63	6.80
1921–1925	4.48	4.53	4.66	4.49	4.32	4.36	4.55	4.73	4.97	5.02	4.59	4.32	4.59
1909	3.00	3.03	3.07	3.00	3.07	3.20	3.41	3.64	3.95	4.38	4.21	3.81	3.48
1910	3.34	3.30	3.61	3.61	3.54	3.64	3.71	3.98	4.28	4.62	4.32	3.47	3.78
1911	3.57	3.61	3.84	3.81	3.84	3.95	4.15	4.18	4.21	4.18	4.01	3.47	3.90
1912	3.58	3.78	3.62	3.73	3.72	3.71	3.71	4.05	4.15	4.15	4.15	4.08	3.87
1913	4.22	4.19	4.44	4.93	5.26	5.02	5.10	5.12	5.12	5.22	5.35	5.18	4.93
1914	4.96	5.27	5.47	5.69	5.47	5.67	5.73	6.01	6.21	6.29	5.86	5.80	5.70
1915	5.72	5.61	5.56	5.65	5.44	5.54	5.97	6.71	7.45	7.52	7.11	6.59	6.24
1916	6.93	7.15	6.91	6.93	6.84	6.31	6.42	6.54	6.84	7.16	6.95	6.74	6.81
1917	6.69	6.56	6.49	6.31	6.46	6.34	6.37	6.40	6.16	6.54	6.03	5.55	6.32
1918	5.39	5.83	5.88	6.06	6.04	5.98	6.21	7.49	8.41	8.49	8.03	8.06	6.82
1919	7.06	7.75	7.74	7.85	8.03	7.21	8.60	8.92	9.63	9.20	8.25	7.72	8.24
1920	7.96	7.97	8.20	8.06	7.88	7.56	7.47	7.42	7.15	7.27	6.28	5.98	7.43
1921	5.93	5.95	5.71	5.41	4.40	4.10	3.69	4.12	4.74	4.96	4.90	4.39	4.86
1922	4.68	4.53	3.97	3.30	3.31	3.90	4.41	4.50	4.24	3.84	3.30	3.25	3.94
1923	3.08	3.25	3.82	4.06	3.83	3.56	3.62	3.36	3.82	4.10	3.48	3.23	3.60
1924	3.19	3.40	3.61	3.50	3.56	3.76	4.51	4.93	5.15	5.95	5.62	5.42	4.38
1925	5.54	5.54	6.20	6.20	6.51	6.48	6.54	6.72	6.91	6.25	5.66	5.32	6.16
1926	5.40	5.42	5.27	5.39	5.52	5.24	5.58	5.70	5.45	4.63	4.06	4.21	5.16
1927	4.21	4.73	4.63	5.03	4.81	5.15	5.95	6.55	6.84	7.13	6.34	5.81	5.52

Bureau of Agricultural Economics. Calculated from quotations in the Review of the River Plate. Prices prior to May, 1924, originally quoted on basis of price per head supplemented from 1916 by price per pound of dressed carcass weight. Calculations assume average dressed weight of 730 pounds or live weight of 1,259 pounds. Live-weight quotations per pound from May, 1924. Converted from Argentine currency at average monthly rate of exchange.

Table 344.—*Cattle and calves: Monthly average price per 100 pounds, Chicago, 1900–1927*

BEEF STEERS[1]

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept	Oct.	Nov.	Dec.	Average
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1900	5.20	4.85	4.85	4.95	5.10	5.20	5.25	5.40	5.35	5.25	5.15	5.00	5.15
1901	4.85	4.80	4.95	5.15	5.30	5.55	5.10	5.10	5.50	5.45	5.50	5.65	5.25
1902	5.70	5.55	6.05	6.45	6.60	6.95	7.10	7.05	6.65	6.20	5.20	4.80	6.20
1903	4.80	4.60	4.75	4.90	4.80	4.90	4.95	5.00	4.95	4.70	4.45	4.55	4.80
1904	4.65	4.50	4.60	4.65	4.85	5.60	5.40	5.10	5.10	5.20	4.95	4.40	4.95
1905	4.65	4.75	5.00	5.75	5.45	5.25	4.95	5.00	5.05	4.80	4.65	4.75	5.05
1906	5.00	5.05	5.15	5.05	5.20	5.20	5.40	5.45	5.50	5.60	5.60	5.50	5.30
1907	5.60	5.55	5.55	5.65	5.65	6.20	6.40	6.25	6.10	6.10	5.40	5.10	5.80
1908	5.30	5.40	6.00	6.50	6.60	6.90	6.45	6.00	5.95	5.70	5.90	6.00	6.10
1909	6.00	5.85	6.10	6.10	6.45	6.45	6.45	6.70	6.75	6.60	6.45	6.20	6.35
1910	6.20	6.35	7.35	7.55	7.50	7.50	7.10	6.85	6.80	6.60	6.20	6.00	6.80
1911	6.15	6.15	6.20	6.10	5.95	6.05	6.30	6.95	6.80	6.75	6.70	6.65	6.40
1912	6.85	6.60	7.20	7.65	7.95	8.00	7.90	8.50	8.15	7.90	8.10	7.85	7.75
1913	7.80	8.25	8.30	8.15	8.00	8.15	8.25	8.30	8.50	8.40	8.25	8.20	8.25
1914	8.45	8.30	8.35	8.50	8.40	8.60	8.80	9.10	9.35	9.05	8.60	8.35	8.65
1915	8.05	7.50	7.65	7.70	8.35	8.80	9.20	9.05	8.95	8.80	8.70	8.35	8.40
1916	8.35	8.35	8.75	9.10	9.50	9.85	9.25	9.45	9.40	9.75	10.15	10.00	9.50
1917	10.15	10.50	11.25	11.75	11.90	12.15	12.35	12.70	13.10	11.70	11.10	11.40	11.60
1918	12.10	12.00	12.60	14.70	15.40	15.85	16.05	15.75	16.00	14.80	15.05	14.90	14.65
1919	15.80	15.95	16.05	15.85	15.00	13.55	15.60	16.45	15.50	16.15	15.10	14.35	15.50
1920	13.95	13.05	13.10	12.30	12.25	14.95	15.00	14.85	15.05	14.20	12.00	10.10	13.30
1921	8.70	8.20	9.05	8.15	8.25	8.00	8.10	8.50	8.00	8.10	7.40	7.00	8.20
1922	7.23	7.62	7.79	7.86	8.21	8.73	9.42	9.52	9.84	10.23	9.16	8.76	8.65
1923	8.88	8.62	8.70	8.81	9.28	9.74	9.71	10.36	10.18	9.94	9.46	8.96	9.40
1924	8.99	8.81	9.17	9.52	9.59	9.28	9.31	9.53	9.52	9.57	8.90	8.71	9.24
1925	8.97	9.15	9.93	9.99	9.90	10.34	11.28	11.10	11.01	10.80	10.16	9.72	10.16
1926	9.49	9.42	9.42	9.11	9.07	9.51	9.44	9.30	10.00	10.00	9.48	9.43	9.47
1927	9.70	9.81	10.20	10.51	10.68	11.12	11.78	12.02	12.63	13.43	13.51	13.08	11.36

VEAL CALVES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept	Oct.	Nov.	Dec.	Average
1901	5.85	5.95	5.75	5.15	5.25	6.00	5.75	5.25	5.85	5.90	5.60	5.00	5.65
1902	6.30	6.75	6.00	5.50	5.75	5.75	6.50	6.75	7.00	6.80	6.60	6.60	6.35
1903	7.10	7.15	6.50	5.75	5.60	6.20	5.65	6.40	6.65	6.40	5.75	4.95	6.20
1904	5.85	6.35	5.65	4.60	4.60	4.90	5.75	5.60	5.90	6.10	6.00	6.00	5.60
1905	6.15	6.50	5.70	5.10	5.25	5.85	5.75	5.90	6.00	6.00	6.00	6.60	5.75
1906	7.00	6.40	6.25	5.60	5.65	5.80	5.60	6.00	6.75	6.50	6.2[illegible]	7.00	6.25
1907	7.00	6.50	6.60	6.00	6.35	6.15	6.40	6.35	6.50	6.00	6.2[illegible]	6.00	6.40
1908	6.75	6.60	6.20	5.50	5.60	5.80	6.00	6.75	7.60	7.20	6.50	7.4[illegible]	6.50
1909	7.60	6.85	7.00	6.30	6.35	6.50	7.00	7.50	7.60	8.10	7.40	8.25	7.10
1910	8.60	8.65	9.00	7.85	7.35	7.85	7.60	7.75	8.50	8.65	8.7[illegible]	8.5[illegible]	8.10
1911	8.75	8.40	7.40	6.60	7.25	7.60	7.40	8.00	8.75	8.60	8.3[illegible]	7.85	7.60
1912	8.75	7.50	8.00	7.40	7.75	8.00	8.75	9.75	11.25	10.00	9.85	10.25	8.75
1913	9.75	9.85	10.50	8.50	9.25	9.75	10.40	11.50	11.25	10.50	10.3[illegible]	10.7[illegible]	10.10
1914	11.00	10.75	9.00	8.85	9.50	9.40	10.60	11.00	11.40	10.65	10.35	8.65	9.90
1915	9.85	10.35	10.00	8.40	9.15	9.60	10.25	11.50	11.25	10.8[illegible]	10.1[illegible]	9.65	10.15
1916	10.15	10.65	9.65	8.75	10.40	11.25	11.40	12.00	12.40	11.50	11.8[illegible]	11.7[illegible]	10.85
1917	13.40	12.65	13.40	12.50	13.25	13.40	13.00	15.15	15.00	14.8[illegible]	13.50	15.[illegible]	13.75
1918	15.35	14.15	15.25	14.50	13.50	15.55	16.70	17.25	18.60	17.10	16.80	16.50	15.75
1919	15.62	15.75	15.01	14.31	14.66	16.37	17.88	19.62	20.52	18.05	17.60	16.56	16.83
1920	17.74	16.73	16.73	14.22	12.12	13.68	13.98	15.08	16.39	14.18	13.7[illegible]	10.39	14.58
1921	11.49	11.02	10.33	8.12	8.66	8.72	9.73	9.39	10.71	8.68	7.70	7.81	9.36
1922	8.36	9.16	8.26	6.97	8.46	8.89	[illegible]	[illegible]	11.92	9.65	8.91	9.42	9.15
1923	10.08	10.63	9.32	8.68	9.51	9.31	10.14	10.36	10.57	9.82	8.15	9.31	9.66
1924	11.08	10.54	9.7[illegible]	9.03	9.30	8.74	9.48	10.63	10.72	10.10	9.02	9.97	9.86
1925	10.72	11.94	11.24	9.49	9.42	9.56	10.91	11.94	12.18	11.19	10.60	11.30	10.87
1926	12.18	12.43	12.06	9.91	11.04	11.09	11.38	12.46	12.59	11.80	11.09	11.31	11.61
1927	12.20	12.40	11.54	10.90	11.07	11.68	13.32	14.75	15.94	14.4[illegible]			12.90

Bureau of Agricultural Economics. Figures prior to January, 1922, for beef steers and prior to January, 1919, for calves, compiled from the Chicago Drovers Journal Yearbook; subsequent figures, the weighted average of all grades of beef steers sold out of first hands and average of daily quotations on veal calves, compiled from data of the livestock and meat reporting service of the bureau.

[1] Western steers not included.

Table 345.—*Cattle and calves: Average price per 100 pounds at Chicago and Kansas City, by months, 1920–1927*

CHICAGO

Year and month	Beef steers					Butcher cattle			Veal calves, light and medium weight, medium to choice	Feeder steers, 800 to 1,000 lbs., common to choice
	Choice, 1,100 lbs. up	1,100 lbs. down				Heifers, common to choice	Cows, common to choice			
		Choice	Good	Medium	Common					
1920	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars		Dollars	Dollars
January	18.14	17.63	15.31	12.37	9.78	10.50	9.86		17.74	10.03
February	15.58	14.89	12.83	11.36	9.63	9.65	9.03		16.73	9.57
March	14.68	14.50	12.96	11.83	10.46	10.33	9.68		16.73	10.30
April	14.19	14.27	12.94	11.85	10.63	10.73	9.87		14.22	10.33
May	13.37	13.71	12.77	11.87	10.70	10.72	9.67		12.12	10.40
June	15.93	15.95	15.04	13.80	12.00	10.93	9.89		13.68	10.78
July	16.59	16.69	15.56	13.79	11.36	10.63	9.47		13.98	10.26
August	16.85	16.83	15.38	13.23	10.46	10.49	8.85		15.08	9.84
										750 to 1,000 lbs.
September	17.53	17.42	15.60	13.12	10.09	10.55	9.20		16.39	9.84
October	17.66	17.59	15.74	12.87	9.74	9.46	8.07		14.18	9.46
November	16.68	16.57	14.29	11.33	8.66	8.93	7.75		13.74	9.06
December	14.01	14.08	11.73	9.42	7.58	7.96	7.10		10.39	7.77
Average	15.93	15.84	14.18	12.24	10.09	10.07	9.04		14.58	----------
1921										
January	11.13	11.13	10.07	8.97	7.78	7.48	6.51		11.49	7.66
February	9.97	9.92	9.08	8.30	7.45	6.98	5.82		11.02	7.36
March	10.33	10.32	9.68	8.87	7.92	7.63	6.54		10.33	8.21
April	9.06	9.19	8.57	7.95	7.12	7.15	6.16		8.12	7.54
May	9.09	9.20	8.58	7.89	7.13	7.23	6.26		8.66	7.55
June	8.81	8.95	8.39	7.78	6.79	6.48	5.47		8.72	6.90
July	9.01	9.26	8.70	7.83	6.53	6.48	5.47		9.73	6.32
August	9.98	10.19	9.18	7.73	6.09	6.42	5.35		9.39	6.25
September	9.52	10.29	9.01	7.19	5.50	6.49	5.21		10.71	5.95
October	10.27	11.32	9.92	7.61	5.37	6.63	5.14		8.68	5.85
November	10.14	11.27	9.81	7.46	5.35	6.26	4.79		7.70	5.66
December	9.69	10.26	8.90	7.34	5.80	5.94	4.75		7.81	5.76
Average	9.75	10.11	9.16	7.91	6.57	6.76	5.62		9.36	6.75
1922										
January	9.45	9.60	8.58	7.40	6.26	5.94	4.82		8.36	5.94
February	9.50	9.35	8.53	7.57	6.54	6.02	5.10		9.16	6.20
March	9.25	9.23	8.54	7.74	6.87	6.53	5.59		8.26	6.51
April	9.04	9.11	8.50	7.82	7.04	6.90	5.84		6.97	6.56
May	8.97	9.09	8.55	8.04	7.45	7.18	5.98		8.46	6.98
June	9.56	9.48	8.93	8.33	7.54	7.12	5.74		8.89	6.86
July	10.27	10.15	9.40	8.59	7.60	7.11	5.98		8.90	6.70
August	10.52	10.45	9.59	8.56	7.14	7.04	6.07		10.88	6.55
September	11.17	11.00	9.86	8.45	6.84	7.09	6.03		11.92	6.67
October	12.26	12.04	10.14	8.18	6.46	7.18	5.92		9.65	6.76
November	12.66	12.48	10.50	8.17	6.09	7.40	5.75		8.91	6.44
December	12.48	12.36	10.57	8.53	6.49	7.39	5.77		9.42	6.58
Average	10.43	10.36	9.31	8.12	6.86	6.91	5.72		9.15	6.56
1923										
January	11.85	11.61	10.21	8.62	6.91	7.52	5.82		10.08	7.01
February	10.87	10.86	9.77	8.68	7.02	7.54	5.96		10.63	6.96
March	10.18	10.25	9.60	8.70	7.32	7.61	6.06		9.32	7.25
April	10.04	9.99	9.36	8.54	7.40	7.66	6.16		8.68	7.17
May	10.38	10.26	9.65	8.87	7.85	7.95	6.50		9.51	7.39
June	10.99	10.81	10.00	8.90	7.30	7.95	6.14		9.31	7.41
						850 lbs. up, good and choice	Good and choice	Common and medium	190 lbs. down, medium to choice	750 lbs. up
July	11.13	10.85	9.88	8.77	6.98	8.96	7.30	4.78	10.14	7.10
August	12.08	11.82	10.64	9.12	6.99	9.22	7.48	4.56	10.36	7.24
September	12.43	12.21	10.80	8.86	6.81	9.58	7.15	4.40	10.57	7.26
October	12.01	12.03	10.96	9.29	6.80	9.62	7.08	4.57	9.82	6.67
November	11.82	11.95	10.65	9.09	6.68	9.32	6.89	4.43	8.15	6.50
December	11.97	12.15	10.78	9.13	6.69	9.63	6.72	4.55	9.31	6.64
Average	11.31	11.23	10.19	8.88	7.06	----------	--------	--------	---------	----------

TABLE 345.—*Cattle and calves: Average price per 100 pounds at Chicago and Kansas City, by months, 1920–1927*—Continued

CHICAGO—Continued

Year and month	Beef steers: Choice, 1,100 lbs. up	Beef steers: 1,100 lbs. down: Choice	Beef steers: 1,100 lbs. down: Good	Beef steers: 1,100 lbs. down: Medium	Beef steers: 1,100 lbs. down: Common	Butcher cattle: Heifers, 850 lbs. up, good and choice	Butcher cattle: Cows: Good and choice	Butcher cattle: Cows: Common and medium	Veal calves, 190 lbs. down, medium to choice	Feeder steers, 750 lbs. up, common to choice
	Dollars	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dollars*	*Dolls.*	*Dolls.*	*Dollars*	*Dollars*
1924										
January	11.66	11.82	10.65	9.21	6.94	9.23	6.67	4.64	11.08	6.72
February	11.62	11.64	10.41	8.82	6.66	8.83	6.40	4.66	10.54	6.71
March	11.84	11.74	10.67	9.05	6.97	9.08	6.74	4.98	9.75	7.17
April	12.08	11.79	10.88	9.25	7.18	9.29	7.48	5.15	9.03	7.51
May	11.65	11.35	10.55	9.19	7.40	9.10	7.72	5.40	9.30	8.26
June	10.88	10.57	9.85	8.62	6.87	8.36	6.81	4.70	8.74	7.78
July	10.94	10.61	10.02	8.65	6.63	8.73	6.85	4.63	9.48	7.30
August	10.75	10.68	9.90	8.20	6.02	9.00	6.86	4.54	10.63	6.74
September	10.88	11.00	9.94	8.22	5.96	9.28	6.42	4.26	10.72	6.66
October	11.21	11.90	10.70	8.74	6.08	9.41	6.15	4.08	10.10	6.50
November	11.57	12.45	11.06	8.60	5.80	9.14	5.92	4.04	9.02	6.25
December	12.28	13.72	12.02	9.11	6.16	9.00	5.78	3.95	9.97	6.11
Average	11.45	11.61	10.55	8.80	6.56	9.04	6.65	4.59	9.86	6.98
1925										
January	11.94	13.29	11.84	9.23	6.66	9.07	6.29	4.41	10.72	6.46
February	11.53	12.29	10.86	8.63	6.48	9.16	6.37	4.66	11.94	6.88
March	11.60	12.03	11.05	9.49	7.53	9.74	6.86	5.01	11.24	7.57
April	11.36	11.70	10.76	9.45	7.75	9.79	7.37	5.31	9.49	7.57
May	11.16	11.56	10.74	9.42	7.87	9.90	7.64	5.55	9.42	7.55
June	11.46	11.75	11.01	9.53	7.52	10.06	7.66	5.26	9.56	6.92

Year and month	Beef steers: 1,100 to 1,500 lbs.	Beef steers: 1,100 lbs. down: Choice	Beef steers: 1,100 lbs. down: Good	Beef steers: 1,100 lbs. down: Medium	Beef steers: 1,100 lbs. down: Common	Butcher cattle: Heifers, 850 lbs. up, good and choice	Butcher cattle: Cows: Good and choice	Butcher cattle: Cows: Common and medium	Vealers (milk-fed), medium to choice	Feeder steers, 800 lbs. up: Good and choice	Feeder steers, 800 lbs. up: Common and medium
1925											
July	13.65	13.53	11.88	9.57	7.07	10.57	7.80	4.87	10.91	7.76	6.52
August	14.94	14.62	11.88	8.72	6.28	10.33	7.78	4.86	11.94	8.20	6.70
September	15.42	14.78	12.01	8.81	6.39	10.03	7.54	4.78	12.18	8.02	6.33
October	15.38	14.51	11.76	8.87	6.60	9.60	7.14	4.64	11.19	8.02	6.45
November	13.64	13.28	11.02	8.73	6.78	9.15	7.15	4.84	10.60	8.18	6.63
December	12.44	11.98	10.37	8.89	7.33	9.03	7.44	5.27	11.30	8.20	6.82
Average	....	12.94	11.26	9.11	7.02	9.70	7.25	4.96	....	....	....
1926											
January	11.60	11.84	10.48	9.24	7.59	9.00	7.32	5.55	12.18	8.34	6.92
February	11.45	11.66	10.54	9.36	7.88	8.84	7.10	5.39	12.43	8.38	7.09
March	10.92	11.09	10.38	9.35	8.05	8.88	7.41	5.70	12.06	8.68	7.43
April	10.30	10.33	9.74	8.85	7.57	8.62	7.16	5.58	9.91	8.46	7.27
May	10.13	10.20	9.70	8.86	7.56	8.66	7.14	5.98	11.04	8.62	7.43
June	10.26	10.22	9.70	8.88	7.74	8.88	7.34	5.73	11.09	8.70	7.45
July	10.18	10.43	9.94	8.81	7.26	8.89	7.06	5.31	11.38	8.05	6.72
August	10.17	10.54	9.88	8.43	6.79	9.09	7.24	5.46	12.46	7.55	6.45
September	11.11	11.47	10.54	8.98	7.18	9.47	6.85	5.21	12.59	7.77	6.53
October	11.26	11.89	10.62	8.80	6.91	9.63	6.82	5.24	11.80	7.63	6.23
November	11.11	12.13	10.88	8.80	6.88	9.31	6.32	4.98	11.09	7.67	6.26
December	11.58	12.98	11.58	9.49	7.40	9.34	6.62	5.27	11.31	7.72	6.47
Average	10.84	11.23	10.33	8.99	7.40	9.05	7.03	5.45	11.61	8.13	6.85
1927											
January	11.87	12.54	11.21	9.32	7.46	9.09	7.00	5.57	12.20	8.02	6.79
February	12.28	12.14	10.63	9.07	7.49	8.88	7.03	5.61	12.40	8.16	6.92
March	12.57	12.03	10.67	9.42	8.13	9.14	7.55	5.96	11.54	8.64	7.36
April	12.78	12.04	10.81	9.72	8.44	9.50	8.06	6.32	10.90	9.00	7.80
May	13.04	12.01	11.15	10.06	8.65	9.98	8.49	6.72	11.07	9.35	8.08
June	13.17	12.09	11.19	9.86	8.47	10.05	8.41	6.31	11.68	9.13	7.88

Year and month	Beef steers: 1,300 to 1,500 lbs.	Beef steers: 1,100 to 1,300 lbs.	Beef steers: 950 to 1,100 lbs.: Choice	Beef steers: 950 to 1,100 lbs.: Good	Beef steers: 800 lbs. up: Medium	Beef steers: 800 lbs. up: Common	Heifers: Choice	Heifers: Good	Cows: Good	Cows: Common and medium	Vealers: Good and choice	Vealers: Medium	Feeder steers, 800 lbs. up: Good and choice	Feeder steers, 800 lbs. up: Common and medium
1927														
July	14.06	13.61	13.00	11.63	10.19	8.18	11.00	9.66	7.68	6.17	13.32	12.01	9.00	7.75
August	14.17	14.04	13.75	12.18	10.08	7.84	11.38	9.87	7.80	6.05	14.75	13.15	9.15	7.81
September	15.31	15.24	15.04	13.11	10.59	7.80	12.16	10.64	8.15	6.28	15.94	14.01	9.68	8.05
October	16.62	16.54	16.31	14.12	11.09	8.03	12.84	11.29	8.14	6.52	14.42	13.26	10.08	8.24
November	17.88	17.73	17.60	15.06	11.67	8.40	12.85	11.41	8.48	6.61	13.48	12.12	10.73	8.99
December	17.75	17.51	17.16	14.96	12.00	9.17	12.53	11.46	9.31	7.18	13.09	11.68	11.13	9.30

Table 345.—*Cattle and calves: Average price per 100 pounds at Chicago and Kansas City, by months, 1920–1927*—Continued

KANSAS CITY

Year and month	Beef steers					Butcher cattle			Veal calves, light and medium weight, medium to choice	Feeder steers, 800 to 1,000 lbs. common to choice
	Choice, 1,100 lbs. up	1,100 lbs. down				Heifers, common to choice	Cows, common to choice			
		Choice	Good	Medium	Common					
1920	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*		*Dollars*	*Dollars*
January	17.10	16.64	14.47	11.92	9.47	10.19	9.13		14.84	10.37
February	14.52	14.19	12.38	10.67	8.89	9.39	8.79		14.10	10.26
March	13.86	13.65	12.32	11.12	9.69	9.76	8.92		14.60	10.62
April	13.54	13.48	12.31	11.23	9.83	9.98	9.25		13.98	10.54
May	12.69	12.98	11.73	10.85	9.79	9 73	9.31		11.41	10.29
June	15.10	15.23	13.77	12.38	10.50	10.21	9.11		11.70	10.57
July	15.84	15.91	14.05	11.87	9.82	10.03	8.54		11.64	10.57
August	15.95	16.01	13.79	11.17	9.14	9.53	8.03		11.03	10.08
										750 to 1,000 lbs.
September	16.72	16.69	14.24	11.21	9.04	9.67	8.18		12.19	10.30
October	16.70	16.51	14.08	10.99	8.50	9.03	7.42		11.95	9.64
November	15.33	15.13	12.92	10.06	7.82	8.78	7.16		11.72	8.75
December	13.01	12.67	10.45	8.05	6.59	7.37	5.02		9.53	7.75
Average	15.03	14.92	13.04	10.96	9.09	9.47	8.31		12.39	--------
1921										
January	10.76	10.46	9.08	7.96	7.06	6.89	5.69		10.59	7.76
February	9.12	8.94	8.18	7.57	6.81	6.22	5.24		9.71	7.26
March	9.77	9.61	8.93	8.30	7.53	6.89	5.97		8.99	8.08
April	8.53	8.65	7.95	7.47	6.92	6.57	5.73		7.69	7.44
May	8.62	8.65	8.03	7.60	7.03	6.51	5.63		7.60	7.29
June	8.36	8.54	7.89	7.27	6.34	5.81	4.88		7.36	6.66
July	8.67	9.15	8.51	7.36	5.73	5.81	4.75		7.45	6.40
August	9.70	9.85	8.84	7.13	5.22	5.88	4.42		6.98	6.16
September	9.36	9.84	8.47	6.48	4.78	6.14	4.65		8.42	5.82
October	9.50	10 34	8.73	6.75	4.74	5.69	4.41		8 42	5.82
November	9.37	10.51	8.33	6.22	4.69	5.80	4.44		7.50	5.51
December	8.76	9.97	8.05	6.28	5.01	5.71	4.38		7.07	5.71
Average	9.21	9.54	8.42	7.20	5.99	6.16	5.02		8.15	6.66
1922										
January	8.63	8.98	7.66	6.48	5.52	5.51	4.39		7.82	6.04
February	8.65	8.60	7.58	6.73	5.95	5.51	4.67		8.11	6.31
March	8.62	8.45	7.73	7.15	6.52	5.97	5.18		7.96	6.69
April	8.56	8.64	8.06	7.51	6.81	6.28	5.41		7.22	6.90
May	8.68	8.76	8.24	7.74	7.10	6.81	5.66		7.90	7.17
June	9.20	9.23	8.63	8.00	7.22	6.86	5.28		7.60	7.20
July	9.97	9.82	9.11	8.14	6.93	6.97	5.26		7.59	7.27
August	10.28	10.12	9.13	7.75	5.98	6.76	5.11		8.42	7.11
September	10.55	10.38	9.01	7.42	5.62	6.92	5.02		8.92	6.82
October	11.57	11.20	9.32	7.31	5.33	6.60	4.98		8.54	6.61
November	12.09	11.75	9.63	7.38	5.38	6.26	4.86		7.64	6.45
December	11.97	11.78	9.81	7.80	5.85	6.16	4.84		7.66	6.38
Average	9.90	9.81	8.66	7.45	6.18	6.38	5.06		7.95	6.75
1923										
January	10.87	10.66	9.35	7.93	6.32	6.27	5.12		8.95	6.94
February	10.44	10.22	8.99	7.87	6.60	6.40	5.21		9.55	7.22
March	9.87	9.78	8.79	7.90	6.80	6.55	5.53		8.50	7.34
April	9.69	9.67	8.86	8.06	7.06	6.69	5.81		7.58	7.31
May	10.20	10.08	9.36	8.50	7.36	6.94	5.98		8.03	7.57
June	10.83	10.65	9.84	8.72	7.20	7.02	5.73		7.85	7.78
						850 lbs. up, good and choice	Good and choice	Common and medium	190 lbs. down, medium to choice	750 lbs. up
July	10.83	10.58	9.61	8.50	6.96	7.82	6.55	4.34	7.82	6.77
August	11.87	11.10	9.76	8.45	6.64	7.85	6.53	4.27	8.04	7.07
September	11.68	11.40	9.84	8.38	6.41	7.80	6.40	4.28	8.02	7.13
October	11.34	11.11	9.59	8.08	6.09	7.82	6.25	4.23	8.15	6.61
November	11.25	11.35	9.68	7.96	6.00	7.62	5.88	3.80	7.71	6.60
December	11.36	11.48	10.01	8.32	6.16	8.04	5.90	3.92	7.75	6.53
Average	10.85	10.67	9.47	8.22	6.63	--------	--------	--------	--------	--------

TABLE 345.—*Cattle and calves: Average price per 100 pounds at Chicago and Kansas City, by months, 1920–1927*—Continued

KANSAS CITY—Continued

Year and month	Beef steers: Choice 1,100 lbs. up	Beef steers, 1,100 lbs. down: Choice	Beef steers, 1,100 lbs. down: Good	Beef steers, 1,100 lbs. down: Medium	Beef steers, 1,100 lbs. down: Common	Butcher cattle: Heifers, 850 lbs up, good and choice	Butcher cattle, Cows: Good and choice	Butcher cattle, Cows: Common and medium	Veal calves, 190 lbs. down, medium to choice	Feeder steers, 750 lbs. up, common to choice
1924	*Dollars*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dollars*	*Dolls.*	*Dolls.*	*Dollars*	*Dollars*
January	11.24	11.36	9.93	8.22	6.12	8.03	5.92	4.03	9.19	6.54
February	10.99	11.10	9.60	8.11	6.11	7.80	5.75	4.00	9.05	6.64
March	11.04	11.00	9.70	8.25	6.38	7.99	6.18	4.41	8.38	6.84
April	11.33	11.14	9.97	8.53	6.75	7.91	6.74	4.88	8.52	6.97
May	11.22	10.90	9.66	8.38	6.75	7.88	6.94	4.88	8.68	7.24
June	10.60	10.27	9.28	8.14	6.56	7.70	6.51	4.53	7.71	6.99
July	10.46	10.28	9.32	7.69	5.78	7.66	6.42	4.23	7.44	6.80
August	10.54	10.61	9.54	7.54	5.24	8.00	6.24	3.93	7.94	6 79
September	10.52	10.64	9.47	7.20	4.90	8.16	6.22	3.98	8.59	6.58
October	10.82	11.25	9.96	7.44	4.90	8.42	5.89	3.90	8.36	6.27
November	10.76	11.58	10.29	7.80	5.08	8.64	5.79	4.05	7.74	6.25
December	11.30	12.47	10.63	8.06	5.23	8.45	5.59	3.88	8.25	6.14
Average	10.90	11.05	9.78	7.95	5.82	8.05	6.18	4.22	8.32	6.67
1925										
January	11.50	12.46	10.84	8.47	5.78	8.47	5.85	4.25	8.84	6.26
February	11.20	12.06	10.48	8.36	6.22	8.63	6.08	4.55	9.34	6.51
March	11.29	11.84	10.50	8.82	6.80	9.05	6.38	4.70	8.99	6.94
April	10.92	11.26	10.29	9.06	7.22	9.33	7 36	5.33	8.01	7.08
May	10.67	11.07	10.08	8.99	7.12	9.24	7.24	5.31	8.00	7.06
June	10.93	11.27	10.29	9.04	6.76	9.33	6.80	4.81	8.03	6.54

Year and month	1,100 to 1,500 lbs.	Choice	Good	Medium	Common	Heifers, 850 lbs up, good and choice	Cows: Good and choice	Cows: Common and medium	Vealers (milk-fed) medium to choice	Feeder steers, 800 lbs. up: Good and choice	Feeder steers, 800 lbs. up: Common and medium
July	12.88	12.81	11.26	9.03	6.30	9.71	6.77	4.42	8.46	7.37	5.31
August	14.00	13.91	11.39	8.37	5.78	9.52	6.90	4.34	9.34	7.54	5.39
September	14.19	14.09	11.26	8.08	5.59	9.15	6.56	4.38	10.27	7.58	5.62
October	14.36	14.11	11.22	8.14	5.73	9.15	6.54	4.44	9.22	7.88	5.94
November	13.37	13.13	10.61	8.02	5.74	8.86	6.60	4.55	8.64	7.86	6.02
December	11.89	11.73	9.95	8.25	6.26	8.61	6.91	4.98	8.81	8.36	6.75
Average	----------	12.48	10.68	8.55	6.28	9.09	6.67	4.67	----------	------	------
1926											
January	11.00	11.04	9.56	8.32	6.64	8.35	6.73	5.08	9.68	8.38	6.86
February	10.68	10.86	9.62	8.52	6.96	8.25	6.70	5.15	10.04	8.48	6.88
March	10.25	10.40	9.52	8.57	7.03	8.23	7.06	5.40	9.71	8.55	6.97
April	9.64	9.78	9.02	8.16	6.87	7.79	6.82	5.36	8.32	8.28	6.86
May	9.52	9.55	8.89	8.06	6.70	7.76	6.91	5.51	9.36	8.27	6.85
June	9.85	9.95	9.27	8.17	6.57	8.09	6.90	5.37	9.10	8.28	6.81
July	9.54	9.87	9.04	7.68	6.19	8.02	6.48	4.83	9.22	7.70	6.20
August	9.36	9.85	8.89	7.52	5.90	8.02	6.36	4.73	9.86	7.41	5.72
September	10.54	11.01	9.97	8.16	6.26	8.60	6.42	4.89	10.61	7.67	5.92
October	10.54	11.21	9.87	8.02	6.17	8.74	6.33	4.83	10.61	7.46	5.86
November	10.20	11.17	9.82	8.06	6.21	8.75	6.38	5.02	9.28	7.42	5.88
December	10.53	11.72	10.44	8.31	6.26	8.67	6.39	5.03	9.11	7.58	5.97
Average	10.14	10.53	9.49	8.13	6.48	8.27	6.62	5.10	9.58	7.96	6.40
1927											
January	11.12	11.78	10.52	8.38	6.30	8.72	6.72	5.35	10.15	8.11	6.41
February	11.76	11.95	10.32	8.28	6.38	8.64	6.78	5.38	9.98	8.28	6.52
March	12.01	11.83	10.38	8.62	6.65	8.84	7.27	5.86	9.59	8.68	6.86
April	12.28	11.67	10.42	9.03	7.06	9.08	7.90	6.40	9.31	8.83	7.02
May	12.23	11.64	10.44	8.95	7.19	9.17	7.83	6.30	9.20	9.04	7.26
June	12.46	11.85	10.71	9.14	7.26	9.41	7.74	5.89	9.20	9.14	7.35

Year and month	1,300 to 1,500 lbs.	1,100 to 1,300 lbs.	950 to 1,100 lbs.: Choice	950 to 1,100 lbs.: Good	800 lbs. up: Medium	800 lbs. up: Common	Heifers: Choice	Heifers: Good	Cows: Good	Cows: Common and medium	Vealers: Good and choice	Vealers: Medium	Feeder steers, 800 lbs. up: Good and choice	Feeder steers, 800 lbs. up: Common and medium
July	13.40	12.66	12.21	10.91	9.32	7.28	10.47	9.43	7.23	5.73	11.14	8.97	9.25	7.38
August	13.42	13.04	13.04	11.35	9.36	7.25	11.18	9.93	7.25	5.76	12.04	9.45	9.29	7.39
September	14.41	14.36	14.24	12.23	9.48	7.16	11.63	10.22	7.34	5.96	11.76	8.85	9.28	7.17
October	15.50	15.48	15.47	13.26	9.98	7.21	12.15	10.59	7.62	6.30	12.48	9.51	9.52	7.18
November	16.90	16.83	16.68	14.12	10.76	7.72	12.43	10.84	7.87	6.48	11.84	9.12	10.17	7.67
December	16.53	16.50	16.36	13.95	10.96	7.91	12.12	10.65	8.21	6.65	10.45	8.19	10.47	8.08

Bureau of Agricultural Economics. Compiled from data of the livestock and meat-reporting service of the bureau.

TABLE 346.—*Cattle and calves: Monthly slaughter under Federal inspection, 1907–1927*

CATTLE

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
	Thousands	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
1907	718	570	555	635	620	588	641	668	696	801	596	546	7,633
1908	643	527	520	463	491	525	563	640	768	821	681	637	7,279
1909	587	490	551	508	536	544	608	652	782	892	799	765	7,714
1910	632	527	599	533	551	621	615	679	796	831	780	644	7,808
1911	626	536	562	499	599	614	591	720	692	828	746	605	7,619
1912	675	515	564	522	563	511	508	632	644	808	691	620	7,253
1913	622	490	484	555	547	556	593	582	656	701	602	590	6,978
1914	585	499	476	474	474	490	505	518	650	744	658	682	6,757
1915	573	466	552	507	534	574	596	590	641	736	702	681	7,153
1916	623	550	597	476	564	648	562	743	791	941	972	844	8,310
1917	823	663	647	654	815	844	784	866	957	1,196	1,099	1,003	10,350
1918	895	785	828	915	782	830	1,020	987	1,143	1,251	1,233	1,160	11,829
1919	1,119	701	640	622	721	644	855	859	855	1,073	1,040	960	10,091
1920	832	631	683	638	626	657	661	686	825	843	859	667	8,609
1921	690	526	621	591	570	640	579	680	689	750	686	586	7,608
1922	642	569	674	590	702	724	697	761	796	884	859	779	8,678
1923	745	634	688	697	762	727	725	821	810	953	846	756	9,163
1924	812	669	665	689	773	670	764	786	870	1,016	952	926	9,593
1925	855	656	736	731	749	732	862	811	866	1,067	861	927	9,853
1926	810	695	786	766	788	852	864	811	971	996	947	887	10,180
1927	786	700	761	742	785	799	743	838	828	895	881	761	9,520

CALVES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
1907	128	99	122	205	224	204	221	206	198	187	126	104	2,024
1908	117	88	137	197	205	211	192	185	187	180	143	116	1,958
1909	135	95	149	200	228	236	213	196	205	205	171	155	2,189
1910	132	117	188	222	252	238	198	206	197	188	168	132	2,238
1911	135	121	180	218	243	232	198	207	184	180	155	128	2,184
1912	152	126	180	245	258	229	201	192	190	193	163	149	2,278
1913	139	118	142	212	205	195	182	149	159	157	124	122	1,902
1914	122	100	145	186	183	187	153	129	130	135	107	119	1,697
1915	109	96	156	199	205	197	162	141	139	148	141	125	1,819
1916	129	143	189	233	267	228	178	207	186	204	217	185	2,367
1917	203	182	212	286	345	277	277	255	272	339	281	216	3,143
1918	210	193	260	351	357	312	355	274	317	306	272	219	3,456
1919	295	210	295	383	391	327	400	319	318	375	344	312	3,969
1920	305	283	390	382	369	431	343	332	348	315	316	245	4,058
1921	282	254	360	366	367	370	324	304	321	309	292	259	3,808
1922	288	279	391	365	401	389	329	345	353	383	348	309	4,182
1923	352	297	368	400	467	388	379	403	338	416	370	324	4,500
1924	373	346	377	466	470	408	421	374	419	473	392	416	4,935
1925	394	378	466	496	481	473	473	439	422	486	398	445	5,353
1926	410	378	464	461	455	480	425	379	408	446	435	410	5,153
1927	397	377	457	454	462	430	355	389	357	413	411	376	4,877

Bureau of Animal Industry.

TABLE 347.—*Beef, frozen: Stocks in cold-storage warehouses and meat-packing establishments, United States, 1916–1927*

Year	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sept. 1	Oct. 1	Nov. 1	Dec. 1
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Average:												
1916–1920	241, 004	232, 368	211, 860	191, 820	155, 267	132, 130	115, 407	117, 061	114, 596	120, 943	149, 804	187, 302
1921–1925	95, 513	92, 530	86, 432	77, 177	64, 149	51, 252	43, 196	34, 901	31, 011	30, 970	42, 716	66, 881
1916	126, 374	132, 266	124, 954	118, 279	90, 176	73, 025	55, 109	58, 867	58, 303	66, 319	92, 815	158, 148
1917	202, 442	190, 909	169, 793	154, 193	118, 391	103, 007	109, 354	108, 729	100, 453	119, 221	179, 032	235, 664
1918	315, 572	292, 114	276, 114	268, 015	212, 725	190, 084	154, 638	180, 962	185, 144	194, 469	224, 312	229, 668
1919	298, 818	294, 514	265, 293	221, 725	184, 586	163, 913	162, 639	159, 279	162, 069	166, 244	184, 196	223, 311
1920	261, 812	252, 037	223, 145	196, 890	170, 455	130, 619	95, 297	77, 469	67, 010	58, 461	68, 663	89, 718
1921	120, 245	119, 965	122, 402	114, 063	100, 672	88, 836	76, 523	66, 262	50, 204	44, 296	49, 014	63, 188
1922	68, 495	61, 522	55, 785	50, 772	45, 341	37, 548	31, 593	27, 727	28, 210	34, 611	47, 929	73, 027
1923	91, 805	89, 272	75, 604	65, 292	54, 522	41, 207	34, 385	24, 112	24, 625	27, 590	43, 772	71, 024
1924	82, 984	79, 944	76, 769	68, 075	52, 941	41, 784	37, 028	29, 435	29, 135	28, 599	45, 857	76, 731
1925	114, 034	111, 947	101, 599	87, 684	67, 271	46, 887	36, 452	26, 970	22, 879	19, 755	27, 008	50, 436
1926	59, 850	55, 705	51, 498	43, 528	32, 372	26, 649	23, 997	23, 509	21, 311	25, 267	38, 079	59, 603
1927	72, 352	67, 431	60, 659	50, 945	39, 712	28, 719	23, 261	18, 552	17, 241	19, 456	26, 096	45, 567

Bureau of Agricultural Economics. Compiled from reports from cold-storage establishments.

TABLE 348.—*Beef, cured and in process of cure: Stocks in cold-storage warehouses and meat-packing establishments, United States, 1916–1927*

Year	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sept. 1	Oct. 1	Nov. 1	Dec. 1
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Average:												
1916–1920	34, 261	33, 612	34, 088	31, 251	27, 730	25, 340	26, 432	26, 723	27, 392	27, 707	29, 904	33, 332
1921–1925	22, 971	23, 202	23, 888	24, 414	23, 826	23, 170	21, 827	20, 399	20, 147	18, 997	19, 173	21, 705
1916	21, 443	20, 852	26, 959	25, 811	21, 869	17, 324	18, 915	18, 589	18, 450	21, 653	30, 013	37, 958
1917	37, 301	35, 891	37, 660	30, 601	29, 409	30, 831	35, 679	32, 401	30, 290	31, 246	32, 223	38, 325
1918	39, 243	38, 793	37, 575	34, 106	29, 217	24, 804	21, 968	28, 065	29, 981	28, 713	29, 339	32, 381
1919	36, 267	35, 810	31, 246	30, 689	27, 822	27, 089	29, 244	30, 943	35, 526	37, 328	37, 595	35, 547
1920	37, 052	36, 715	37, 002	35, 047	30, 333	26, 653	26, 355	23, 617	22, 711	19, 594	20, 352	22, 448
1921	22, 567	22, 926	24, 006	24, 282	21, 516	20, 716	19, 697	17, 829	17, 130	15, 526	14, 472	17, 144
1922	16, 313	16, 774	17, 997	18, 744	19, 166	19, 304	19, 113	19, 304	20, 081	18, 961	19, 884	22, 602
1923	24, 450	24, 841	24, 987	25, 210	24, 013	23, 816	22, 835	21, 781	21, 416	20, 597	19, 640	22, 142
1924	22, 593	22, 711	23, 238	25, 199	25, 482	24, 285	22, 390	20, 377	19, 771	18, 939	21, 387	23, 508
1925	28, 930	28, 758	29, 210	28, 634	28, 952	27, 731	25, 102	22, 704	22, 335	20, 964	20, 473	23, 128
1926	25, 146	24, 833	26, 192	27, 253	27, 606	25, 930	24, 691	22, 539	20, 386	20, 983	23, 119	26, 374
1927	28, 521	27, 823	27, 361	26, 214	23, 216	21, 694	20, 495	17, 170	16, 205	16, 422	17, 220	19, 778

Bureau of Agricultural Economics. Compiled from reports from cold-storage establishments.

TABLE 349.—*Beef and beef products: International trade, average 1911–1913, annual 1923–1926*

Country	Year ended Dec. 31									
	Average, 1911–1913		1923		1924		1925		1926, preliminary	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
PRINCIPAL EXPORTING COUNTRIES	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Argentina	144	940,300	12	1,423,964	4	1,917,631	14	1,694,255	41	1,682,805
Australia	437	301,882	[1] 1,392	[1] 269,083	[1] 6,498	[1] 155,722	[1] 1,930	[1] 381,233	[1] 1,567	[1] 308,042
Brazil	48,989	171	5,852	184,137	14,138	167,214	11,512	135,063	7,329	20,833
Canada	3,091	6,448	2,467	24,380	431	25,522	447	36,312	361	29,340
China	85	8,787	1,414	6,314	813	8,641	577	7,418	2,851	5,297
Denmark	18,815	43,485	11,217	37,103	11,858	13,632	11,862	61,214	13,242	42,304
Hungary	[2] 12,983	[2] 3,762	97	54	6,799	12,368	833	8,508	79	6,010
Netherlands	256,296	326,176	199,164	202,545	224,746	243,505	211,157	248,405	170,463	248,114
New Zealand	398	80,543	437	141,494	613	131,137	577	138,672	565	97,742
Rumania	4	2,566	544	4,061	553	9,939	437	13,492	[3] 375	[3] 12,798
United States	17,668	213,722	19,356	192,368	18,104	190,259	15,870	162,640	20,106	158,612
Uruguay	152	119,675		402,696		348,700		377,687		366,418
PRINCIPAL IMPORTING COUNTRIES										
Belgium	6,034	1,577	150,377	4,341	231,890	15,783	191,598	51,246	130,742	58,554
British India	7,434	773	8,043	1,227	8,336	1,285	10,239	1,289	15,716	1,230
British Malaya			2,635	615	5,653	568	6,103	608	6,669	630
Chile	6,636	298	852	167	579	180	8,763	190		
Cuba	37,822		54,051		54,849		49,444		39,917	
Czechoslovakia			9,433	10	19,864	33	17,243	207	10,775	375
Egypt	476		4,697	22	5,754	48	3,801	10	4,302	3
Finland	14,755	9	4,317	34	3,885	63	3,499	101	5,209	55
France	41,318	62,361	164,069	51,865	253,159	34,618	249,865	37,026	187,364	24,238
Germany	212,150	942	230,906	1,295	296,410	1,727	442,993	3,090	440,883	2,138
Hong Kong			1,608	433	1,885	417	[4] 399	[4] 271		
Irish Free State					10,304	8,187	11,102	8,115	10,760	7,318
Italy	131	([5])	28,784	536	31,498	558	26,767	574	24,162	279
Japan	9,002		70,204		73,484		54,819		74,707	
Norway	20,203	2,337	21,182	1,605	22,805	776	16,697	754	16,645	1,830
Philippine Islands	15,837		6,438		9,175		10,377		12,052	
Poland			571	312	3,154	1,433	1,765	14,140	195	31,667
Spain	966	38	11,615		15,143	222	18,413		12,821	
Sweden	12,912	17,285	15,623	7,685	20,911	6,684	20,720	12,904	19,430	7,645
Switzerland	9,052	440	6,937	722	5,510	502	5,483	749	6,568	773
Union of South Africa	17,622	292	12,183	1,536	10,503	9,603	9,601	22,754	6,186	34,998
United Kingdom	1,252,292	27,595	1,788,994	31,463	1,777,833	44,808	1,854,596	39,689	1,899,726	34,029
Total, 34 countries	2,023,704	2,161,464	2,835,471	2,992,067	3,147,141	3,351,765	3,269,503	3,458,616	3,141,808	3,184,077

Bureau of Agricultural Economics. Official sources.

[1] Year ended June 30. [2] Average for Austria-Hungary. [3] 9 months. [4] 6 months. [5] Not separately stated.

TABLE 350.—*Beef: Wholesale price per pound in Chicago and New York and retail price of certain cuts, 1913–1927*

Year	Wholesale		Retail											
			Sirloin steak			Round steak			Chuck roast			Rib roast		
	Good native steer, Chicago	Native sides, New York	Chicago	New York	Average leading cities	Chicago	New York	Average leading cities	Chicago	New York	Average leading cities	Chicago	New York	Average leading cities
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1913	13.0	12.5	23.2	25.9	25.4	20.2	25.0	22.3	15.4	16.0	16.0	19.5	21.8	19.8
1914	13.6	13.5	25.3	26.8	25.9	22.4	26.3	23.6	16.9	16.8	16.7	20.7	22.1	20.4
1915	12.9	12.6	25.7	26.8	25.7	22.1	26.0	23.0	16.7	16.5	16.1	21.3	22.2	20.1
1916	13.8	13.4	26.8	28.1	27.3	22.6	27.4	24.5	16.6	17.3	17.1	21.9	23.2	21.2
1917	16.7	16.4	29.3	32.6	31.5	25.8	32.6	29.0	20.3	21.3	20.9	24.1	27.4	24.9
1918	22.1	20.9	35.3	40.9	38.9	32.3	42.3	36.9	25.9	28.5	26.6	29.7	35.3	30.7
1919	23.3	21.5	38.3	43.9	41.7	34.3	45.7	38.9	26.7	29.9	27.0	31.4	39.1	32.5
1920	23.0	20.8	43.0	46.9	43.7	36.3	47.3	39.5	25.9	28.9	26.2	33.7	40.5	33.2
1921	16.3	14.8	38.0	42.1	38.8	31.0	41.4	34.4	20.7	23.1	21.2	30.2	36.4	29.1
1922	15.0	13.8	37.2	41.1	37.4	29.1	39.6	32.3	19.1	21.4	19.7	28.8	35.3	27.6
1923	15.8	14.5	39.8	42.5	39.1	30.7	40.8	33.5	19.0	22.4	20.2	30.2	36.3	28.4
1924	17.1	15.1	41.2	43.0	39.6	32.1	41.4	33.8	21.0	23.1	20.8	31.6	36.9	28.8
1925	18.0	15.9	43.7	45.4	40.6	34.2	43.1	34.7	23.1	24.4	21.6	33.6	38.8	29.6
1926	16.4	15.1	44.3	45.4	41.3	35.9	43.5	35.6	25.2	24.6	22.5	34.9	38.8	30.3
1927	18.6	(1)	46.2	47.6	42.6	37.2	45.2	37.1	26.2	26.4	23.7	35.6	40.4	31.3

Bureau of Agricultural Economics. Compiled from Bureau of Labor Statistics Wholesale and Retail Price Bulletins.

1 Not reported since July, 1927.

TABLE 351.—*Cattle: Tick eradication progress and status of the work June 30, 1927*

State	Quarantined counties		Released counties, June 30, 1927			Released counties, tick-free on—			Cattle inspected and dipped, year ended June 30, 1927	
	July 1, 1906	June 30, 1927	Tick free	With one or more infested herds	Total counties released	Nov. 1, 1925	Nov. 1, 1926	Nov. 1, 1927	Herds	Cattle
Alabama	67	4	57	6	63	49	49	57	278,115	1,816,141
Arkansas	75	22	44	9	53	31	41	44	263,258	1,209,121
California	15	0	15	0	15	15	15	15	0	0
Florida	67	49	14	4	18	7	12	14	202,836	1,819,013
Georgia	158	0	153	5	158	149	151	153	24,905	287,722
Kentucky	2	0	2	0	2	2	2	2	0	0
Louisiana	64	43	4	17	21	4	11	4	100,652	1,142,469
Mississippi	82	23	46	13	59	47	47	46	88,210	805,766
Missouri	4	0	4	0	4	4	4	4	0	0
North Carolina	73	0	71	2	73	65	73	71	646	6,472
Oklahoma	61	4	54	3	57	52	55	54	39,823	284,941
South Carolina	46	0	44	2	46	40	40	44	49,344	223,955
Texas	198	80	77	41	118	69	72	77	378,344	8,915,052
Virginia	31	0	26	5	31	25	27	26	7,552	22,769
Tennessee	42	0	42	0	42	42	42	42	0	0
Total	985	225	653	107	760	601	641	653	1,433,775	16,533,421

Bureau of Animal Industry. More that 15,000 vats were in use for official dipping during the year.

TABLE 352.—*Cattle and calves: Statement of livestock and meat situation, 1921–1927*

Item	Unit	1921	1922	1923	1924	1925	1926	1927
Federally inspected slaughter:								
Cattle	Thousands	7,608	8,678	9,163	9,593	9,853	10,180	9,520
Calves	do	3,808	4,182	4,500	4,935	5,353	5,153	4,876
Average live weight:								
Cattle	Pounds	999.24	981.12	952.89	949.64	954.06	964.06	945.99
Calves	do	170.07	169.71	172.82	176.78	176.03	176.39	175.94
Total live weight:								
Cattle	1,000 pounds	7,602,498	8,513,970	8,730,870	9,109,968	9,400,390	9,814,272	9,005,923
Calves	do	647,553	709,654	777,746	872,415	942,211	908,865	857,867
Average live cost per 100 pounds:								
Cattle	Dollars	[1] 6.68	6.57	6.82	6.64	7.11	7.32	8.62
Calves	do	[1] 7.79	7.92	7.86	7.67	8.66	9.82	10.58
Total live cost:								
Cattle	1,000 dollars	507,847	559,368	595,445	604,902	668,368	718,405	776,311
Calves	do	50,444	56,205	61,131	66,914	81,596	89,251	90,762
Carcasses condemned:								
Cattle	Thousands	47	69	77	89	96	98	75
Calves	do	8	12	12	13	11	12	10
Number passed for food:								
Cattle	do	7,561	8,608	9,085	9,504	9,757	10,082	9,445
Calves	do	3,800	4,169	4,488	4,922	5,341	5,141	4,866
Average dressed weight:								
Cattle	Pounds	540.39	530.63	515.85	508.10	506.16	518.33	506.74
Calves	do	96.19	94.20	99.34	101.26	101.46	103.66	101.41
Total dressed weight: [2]								
Beef	1,000 pounds	4,087,391	4,573,267	4,685,704	4,829,474	4,938,948	5,225,909	4,784,563
Veal	do	365,906	395,267	443,182	498,588	540,769	530,603	492,563
Imports, fresh beef and veal	do	32,378	36,694	19,356	18,104	15,870	20,106	42,574
Storage Jan. 1	do	142,813	84,808	116,255	105,577	142,964	84,996	100,873
Total supply	do	4,628,488	5,090,036	5,264,498	5,451,743	5,638,551	5,861,615	5,420,573
Storage Dec. 31	do	84,808	116,255	105,577	142,964	84,996	100,873	76,947
Exports [3]	do	42,958	35,054	29,459	27,203	26,541	24,862	19,489
Apparent domestic consumption	do	4,500,722	4,938,727	5,129,462	5,281,576	5,527,014	5,735,880	5,324,136
Apparent per capita consumption	Pounds	41.50	44.94	45.92	46.41	47.90	48.97	44.88

Bureau of Agricultural Economics.

[1] Average for 10 months, 1921. [2] Sum of monthly production. [3] Exports and reexports of fresh, cured, and canned beef and veal.

TABLE 353.—*Swine: Numbers and prices to producers in the United States, 1840, 1850, 1860, 1867–1928*

Year	Swine [1] on farms	Price per head to producer Jan. 1	Swine on farms and elsewhere [2]	Year	Swine [1] on farms	Price per head to producer, Jan. 1	Swine on farms and elsewhere [2]
	Thousands	*Dollars*	*Thousands*		*Thousands*	*Dollars*	*Thousands*
1840, June 1	*26,801*			1898	39,760	4.39	55,100
1850, June 1	*30,354*			1899	38,652	4.40	54,900
1860, June 1	*33,513*			1900	[4] 37,079	5.50	53,900
1867	24,694	4.03	28,200	1900, June 1	*62,868*		
1868	24,317	3.29	28,300	1900	52,600		
1869	23,316	4.65	27,600	1901	53,200	6.20	55,700
1870, June 1	*25,135*			1902	46,800	7.03	48,700
1870	26,751	5.59	32,300	1903	47,200	7.78	48,000
1871	29,458	5.61	36,400	1904	49,500	6.15	49,200
1872	31,796	4.01	40,100	1905	52,000	5.99	50,600
1873	32,632	3.67	42,100	1906	54,600	6.18	57,000
1874	30,861	3.98	40,700	1907	57,300	7.62	61,300
1875	28,062	4.80	37,800	1908	61,300	6.05	64,200
1876	25,727	6.00	35,500	1909	57,000	6.55	63,400
1877	28,077	5.66	39,500	1910, Apr. 15	*58,186*		
1878	32,262	4.85	46,500	1910	49,300	9.17	57,200
1879	34,766	3.18	51,200	1911	55,700	9.37	63,700
1880, June 1 [3]	*47,682*			1912	55,700	8.00	62,700
1880	34,034	4.43	51,200	1913	54,000	9.86	57,900
1881	36,248	4.70	53,100	1914	51,800	10.40	55,000
1882	44,122	5.97	62,900	1915	57,000	9.87	59,600
1883	43,270	6.75	60,000	1916	59,700	8.40	61,700
1884	44,201	5.57	59,600	1917	56,700	11.75	60,700
1885	45,143	5.02	59,300	1918	61,200	19.54	63,000
1886	46,092	4.26	58,900	1919	63,800	22.02	65,300
1887	44,613	4.48	55,500	1920, Jan. 1	*59,346*		
1888	44,347	4.98	53,600	1920	59,959	19.08	62,451
1889	50,302	5.79	59,200	1921	58,602	12.95	61,300
1890, June 1 [3]	*57,410*			1922	59,559	10.06	61,973
1890	51,603	4.91	59,100	1923	69,044	11.58	71,466
1891	50,625	4.15	59,400	1924	66,361	9.72	68,845
1892	52,398	4.60	62,900	1925, Jan. 1	*50,854*		
1893	46,095	6.41	56,700	1925	55,568	12.38	58,228
1894	45,206	5.98	57,000	1926	52,148	15.21	54,448
1895	44,166	4.97	57,000	1927	54,408	15.97	56,807
1896	42,843	4.35	56,600	1928	58,969	12.03	61,570
1897	40,600	4.10	55,000				

Data for swine on farms and price paid to producers (except italic figures, which are from the census) from reports of the Bureau of Agricultural Economics as of Jan. 1.

[1] Figures 1900–1919 are tentative revised estimates of the Bureau of Agricultural Economics not previously published and are subject to change.

[2] Data for swine on farms and elsewhere as of Jan. 1 prior to 1920 estimated by the Bureau of Animal Industry are tentative and subject to revision after more extensive research. Census figures prior to 1920 were adjusted to a Jan. 1 basis and to include all ages and all animals in towns, villages, and ranges, as well as on farms. For methods see Department Circular 241 as published in 1922. Figures from 1920–1928 are the estimates of the Bureau of Agricultural Economics of swine on farms plus an estimate made by the Bureau of Animal Industry of swine in towns and villages.

[3] Figures for census years 1880 and 1890 exclude estimate of unenumerated swine on ranges as follows: 1880, 2,090,970; 1890, 17,276.

[4] Original estimate of the Bureau of Agricultural Economics.

Table 354.—*Hogs, including pigs: Estimated number on farms and value per head, by States, January 1, 1924–1928*

State	Number Jan. 1					Value per head Jan. 1				
	1924	1925	1926	1927	1928 [1]	1924	1925	1926	1927	1928 [1]
	Thousands	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
Maine	60	56	60	67	77	17.00	18.50	18.50	19.00	18.00
New Hampshire	18	18	19	23	29	16.00	18.00	19.00	18.00	18.00
Vermont	53	45	44	53	61	13.80	14.00	18.00	19.00	14.00
Massachusetts	65	60	67	84	97	17.00	17.00	19.00	18.00	18.50
Rhode Island	6	4	4	4	5	18.00	20.00	20.00	21.00	21.00
Connecticut	21	18	18	21	24	18.00	22.00	23.00	21.00	19.70
New York	347	259	249	284	341	14.70	17.00	19.50	18.50	16.00
New Jersey	66	56	56	60	62	17.00	17.50	19.50	21.00	17.00
Pennsylvania	980	734	683	731	841	14.50	16.00	19.00	19.00	16.00
Ohio	2,950	2,440	2,489	2,439	2,537	10.00	12.20	15.00	17.00	12.40
Indiana	3,550	3,100	2,820	2,961	3,227	9.80	11.90	15.70	17.00	12.50
Illinois	5,625	4,725	4,442	4,709	5,039	10.10	13.60	16.50	17.00	12.50
Michigan	1,143	855	820	845	913	10.00	14.00	16.20	17.50	13.00
Wisconsin	1,900	1,580	1,660	1,826	1,863	9.90	13.00	16.60	17.00	13.00
Minnesota	3,830	3,600	3,456	3,673	3,710	10.30	14.00	17.50	17.50	13.50
Iowa	11,415	9,633	9,633	10,060	10,650	10.30	15.00	17.00	17.50	12.50
Missouri	4,860	3,864	3,671	3,991	4,720	8.50	9.30	13.30	15.50	10.50
North Dakota	738	784	682	572	652	10.00	12.50	16.50	16.50	12.00
South Dakota	3,000	2,760	2,300	2,183	2,445	10.10	13.20	16.50	17.00	13.00
Nebraska	5,983	4,818	4,700	4,330	4,546	10.00	13.20	17.20	17.50	13.00
Kansas	2,747	2,467	2,220	2,109	2,320	9.00	12.00	14.50	15.50	12.50
Delaware	27	24	21	24	26	10.50	14.00	16.00	19.50	12.00
Maryland	219	188	179	192	221	11.25	12.90	14.90	16.00	13.00
Virginia	678	584	531	558	642	9.90	10.70	11.70	13.00	11.00
West Virginia	212	184	180	202	240	11.00	12.00	14.80	15.00	13.00
North Carolina	1,020	894	832	849	951	12.50	12.00	13.10	12.80	11.70
South Carolina	830	580	452	443	532	11.30	11.40	11.10	12.00	10.50
Georgia	1,520	1,275	1,109	1,187	1,424	8.00	9.00	9.00	9.00	7.00
Florida	640	498	458	485	543	7.00	6.50	7.00	8.00	6.70
Kentucky	1,185	932	839	965	1,081	7.00	9.00	12.40	13.00	9.30
Tennessee	1,340	1,035	880	968	1,084	7.40	9.00	11.80	13.00	10.00
Alabama	1,049	845	776	854	982	7.80	9.40	9.40	10.00	9.50
Mississippi	900	729	678	744	878	7.40	8.40	10.10	10.70	9.50
Arkansas	878	857	823	946	1,088	6.10	8.00	9.10	9.50	8.40
Louisiana	580	528	496	511	460	7.60	8.40	9.00	9.50	9.50
Oklahoma	1,175	969	736	883	1,104	6.70	9.40	11.80	14.50	10.50
Texas	1,600	1,250	1,000	1,250	1,375	9.00	10.00	12.20	14.80	12.00
Montana	292	280	250	240	264	11.20	12.00	15.00	15.20	14.00
Idaho	400	325	276	318	375	9.40	10.50	14.00	16.00	11.00
Wyoming	129	102	90	110	138	10.00	10.50	14.80	15.50	14.00
Colorado	575	493	443	443	509	9.50	11.00	14.30	16.00	13.00
New Mexico	71	59	47	64	77	9.00	11.00	13.00	14.30	12.00
Arizona	24	19	18	18	17	9.50	11.00	13.00	16.00	13.00
Utah	90	64	60	75	98	10.10	11.50	14.00	15.00	12.50
Nevada	31	25	22	26	29	9.00	12.00	15.00	15.00	12.00
Washington	221	198	168	198	238	13.00	13.00	15.70	17.00	14.00
Oregon	270	223	223	245	270	10.50	11.00	15.00	16.00	12.00
California	624	532	468	585	614	10.50	10.20	15.20	17.00	13.00
United States	65,937	55,568	52,148	54,408	58,969	9.73	12.38	15.21	15.97	12.03

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

[1] Preliminary.

TABLE 355.—*Swine: Numbers in countries having 150,000 and over, averages 1909–1913 and 1921–1925, annual 1925–1927*

Country	Month of estimate	Average, 1909–1913[1]	Average, 1921–1925[1]	1925	1926	1927
NORTH AND CENTRAL AMERICA AND WEST INDIES		*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
Canada	June	3,350	4,344	4,426	4,360	4,695
United States	January	61,865	61,604	55,568	52,148	54,408
Mexico	June	[2 3] 811	1,125	1,005	2,693	
Guatemala		188	57	53	92	51
Salvador		220				
Dominican Republic	May		866			
Total above countries reporting:						
Pre-war to 1926		66,214	67,130	61,052	59,293	
Pre-war to 1927		65,403	66,005	60,047	56,600	59,154
Estimated total[4]		67,600	68,800			
SOUTH AMERICA						
Colombia		[5] 711	1,352	1,366	1,400	
Venezuela		195	512			
Peru	February-April		449			
Chile		172	255	247		
Brazil	September	18,401	[2 6] 16,169			
Uruguay		[2 7] 180	278			
Argentina	December[8]	[9] 2,901	[10] 1,437			
Total South American countries reporting:						
Pre-war to 1926		711	1,352	1,366	1,400	
Estimated total[4]		23,200	20,600			
EUROPE						
England and Wales	June	2,390	2,658	2,644	2,200	2,687
Scotland	do	150	167	154	145	186
Ireland	do	1,261	1,067	844	1,043	1,414
Norway[11]	do	[12] 334	213	253	303	300
Sweden	do	1,023	1,056	[13] 1,100		
Denmark	July	2,715	2,314	2,517	3,122	3,729
Holland	May-June	1,305	1,568			
Belgium	December[8]	1,533	1,081	1,139	1,152	1,144
France	do.[8]	7,529	5,302	5,802	5,793	5,777
Spain	do.[8]	2,544	4,500	4,160	5,267	5,032
Portugal		[2 14] 1,111	1,008			
Italy	March-April	2,685	2,630			
Switzerland	April	[2] 570	[2] 640		635	
Germany	December[8]	22,533	15,776	16,895	16,200	19,412
Austria	do.[8]	1,932	1,429			
Czechoslovakia	do.[8]	2,516	2,201		2,539	
Hungary	July	[15] 3,322	2,433	2,633	2,520	2,387
Yugoslavia	January	3,956	2,875	2,802	2,806	
Greece		346	363			
Bulgaria	December[8]	546	911	574		
Rumania	do[8]	3,262	2,976	3,133	3,088	3,168
Poland		5,231	5,642	[16] 6,000		
Lithuania		1,358	1,521	1,488	1,441	
Latvia	June	557	465	497	521	535

[1] Average for 5-year period if available, otherwise for any year or years within this period except as otherwise stated. In countries having changed boundaries the figures are estimated for 1 year only of numbers within present boundaries. For the pre-war average the years immediately preceding the war have been used.

[2] Census.

[3] Year 1902.

[4] These totals include interpolations for a few countries not reporting each year and rough estimates for some others.

[5] Year 1915.

[6] Year 1920.

[7] Year 1908.

[8] Countries reporting as of December have been considered as of Jan. 1 of the following year—i. e., figure for number of swine in France as of Dec. 31, 1924, has been put in 1925 column.

[9] Census June, 1914.

[10] Census 1922.

[11] Number in rural communities.

[12] September.

[13] Estimate forwarded by Assistant Trade Commissioner Wrenn in his monthly report for January, 1927, based on information furnished by consuls or other commercial representatives in the separate countries.

[14] Year 1906.

[15] April.

[16] Unofficial.

TABLE 355—*Swine: Numbers in countries having 150,000 and over, averages 1909–1913 and 1921–1925, annual 1925–1927*—Continued

Country	Month of estimate	Average, 1909–1913	Average, 1921–1925	1925	1926	1927
EUROPE—continued		*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
Estonia		252	299	339	333	354
Finland	September	422	378	378	391	
Russia		[17] 16,692	11,148	15,351	14,379	[18] 15,844
Total European countries reporting:						
Pre-war to 1926		70,810	55,173	61,029	60,704	
Pre-war to 1927		65,074	50,399	56,361	56,066	61,969
Estimated total [4]		88,200	73,000			
AFRICA						
Union of South Africa	April-August	[2] 1,082	870	801		
Madagascar	February	600	369	386		
Estimated African total [4]		2,200	1,900			
ASIA						
Russia	Summer	[19] 2,939	[20] 2,099	[21] 3,343	[21] 3,577	[21] 3,780
China		76,819				
Japan	December [8]	297	590	743	673	
Chosen	do [8]	629	1,078	1,130	1,150	1,221
Formosa	do [8]	1,293	1,302	1,341	1,435	
Siam	March	749	864			
Straits Settlements		139	[22] 267			
Philippine Islands	December [8]	1,763	5,754	7,887	8,811	
Dutch East Indies—Outer possessions.	do [8]		783			
Total Asiatic countries reporting:						
Pre-war to 1926		6,921	10,823	14,444	15,646	
Pre-war to 1927		3,568	3,177	4,473	4,727	5,001
Estimated total [4]		85,600	89,800			
OCEANIA						
Australia	December [8]	910	918	980	1,128	
New Zealand	January	[2] 349	398	433	473	516
Total Oceanic countries reporting:						
Pre-war to 1926		1,259	1,316	1,413	1,601	
Pre-war to 1927		349	398	433	473	516
Estimated total [4]		1,280	1,330			
World total countries reporting:						
Pre-war to 1926		145,915	135,794	139,304	138,644	
Pre-war to 1927		134,394	119,979	121,314	117,866	126,640
Estimated world total [4]		268,100	255,400			

Bureau of Agricultural Economics. Official estimates and International Institute of Agriculture unless otherwise stated.

[2] Census.

[4] These totals include interpolation for a few countries not reporting each year and rough estimates for some others.

[8] Countries reporting as of December have been considered as of Jan. 1 of the following year—i. e., figure for number of swine in France as of Dec. 31, 1924, has been put in 1925 column.

[17] Year 1916.

[18] No estimate for Crimea so have included the 1926 estimate for that territory. Exclusive of Crimea the number is 15,792,100.

[19] Year 1916. The 1920 census figures for Turkestan and Azerbaijan (part of Transcaucasia) have been included as no estimate was made for these regions in 1916.

[20] Includes estimated number in Turkestan and Azerbaijan (part of Transcaucasia) according to census of 1920 with the estimates for the years 1921, 1922, and 1923 and the estimated number in Turkestan, Transcaucasia, and Kazak-Kirghiz in 1924 with the year 1925.

[21] Includes 649,200 swine in Turkestan, Kazak-Kirghiz and Transcaucasia in 1924. The number in Siberia and the Far East only was as follows: 1925, 2,693,400; 1926, 2,928,000; 1927, 3,131,300.

[22] Year 1919.

TABLE 356.—*Hogs: Summary of spring and fall pig surveys, 1925–1927*

State and division	Sows farrowed						Average number of pigs saved per litter [1]				Intended farrowings [2] (sows bred or to be bred)					
	Spring, 1925, compared with spring, 1924	Fall, 1925, compared with fall, 1924	Spring, 1926, compared with spring, 1925	Fall, 1926, compared with fall, 1925	Spring, 1927, compared with spring, 1926	Fall, 1927, compared with fall, 1926	1926 Spring	1926 Fall	1927 Spring	1927 Fall	Fall, 1925, compared with actual 1924	Spring, 1926, compared with actual 1925	Fall, 1926, compared with actual 1925	Spring, 1927, compared with actual 1926	Fall, 1927, compared with actual 1926	Spring, 1928, compared with actual 1927
	Per cent	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Number*	*Number*	*Number*	*Number*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Maine	80.4	89.5	99.5	112.0	103.1	101.0	6.2	6.8	6.7	7.1	107.2	130.2	138.4	100.4	140.4	115.0
New Hampshire	91.3	90.1	100.8	103.7	81.0	123.1	6.9	6.7	6.8	7.8	113.9	119.1	190.1	105.4	129.8	106.1
Vermont	75.0	81.3	110.0	113.8	107.6	97.2	6.7	7.6	7.5	7.0	104.4	109.8	131.1	108.0	110.4	112.5
Massachusetts	91.9	102.3	100.0	100.7	99.7	153.1	5.2	5.7	5.6	5.9	111.2	114.6	139.5	102.1	141.8	115.4
Rhode Island	66.7	86.7	90.0	100.0	122.2	163.2	6.4	6.7	6.1	4.8	176.5	106.2	188.9	121.4	150.0	125.0
Connecticut	78.2	98.6	107.5	104.5	102.6	110.2	6.4	6.4	6.4	4.7	79.6	102.5	158.9	119.5	88.0	95.2
New York	84.8	92.5	93.1	114.1	105.4	133.3	6.7	7.0	7.1	7.1	107.4	108.5	127.1	117.2	129.9	126.6
New Jersey	77.7	101.7	109.9	115.8	95.8	102.4	5.6	6.2	5.7	5.8	100.4	109.4	154.6	119.0	116.1	98.1
Pennsylvania	76.7	98.8	88.6	114.6	102.4	107.7	6.1	6.2	6.6	6.4	95.2	106.3	117.7	115.0	129.7	102.8
Ohio	80.7	82.6	102.5	106.2	108.4	104.1	5.8	5.8	6.0	5.6	85.8	103.4	126.7	114.1	121.3	98.0
Indiana	77.9	80.6	106.3	106.0	106.8	102.3	5.9	5.6	6.0	6.1	86.4	108.0	130.5	113.6	119.3	99.8
Illinois	83.0	89.0	106.2	110.5	104.3	103.6	5.6	5.5	5.8	5.9	92.3	112.2	134.3	106.5	113.6	103.9
Michigan	84.2	87.8	100.1	110.9	104.3	99.9	6.1	6.3	6.6	6.6	92.8	108.4	143.6	114.2	125.3	93.3
Wisconsin	84.5	96.8	106.3	107.4	98.8	96.6	5.9	6.1	6.3	6.3	92.4	117.2	144.6	109.7	107.2	99.2
Minnesota	88.0	81.7	106.6	100.5	99.3	97.8	5.6	5.8	5.6	5.6	93.7	110.1	136.9	105.9	120.6	95.3
Iowa	81.5	93.0	101.0	112.2	103.0	120.6	5.4	5.5	5.3	5.5	92.4	113.7	129.6	109.4	118.2	94.8
Missouri	77.9	82.8	104.7	100.4	106.4	110.0	5.8	5.9	5.8	6.1	82.7	110.0	134.4	112.8	123.1	105.8
North Dakota	73.7	77.2	98.5	79.8	89.6	131.3	5.8	5.9	5.8	5.5	90.1	112.7	181.5	106.6	169.3	105.7
South Dakota	77.6	84.3	101.0	80.3	92.3	114.5	5.4	5.2	5.1	5.4	93.5	108.2	161.6	104.1	159.1	109.3
Nebraska	74.8	78.8	102.2	97.3	96.5	125.3	5.2	5.4	4.9	5.3	88.5	111.8	143.8	106.5	144.3	106.9
Kansas	74.3	77.0	102.6	100.1	102.6	113.2	5.6	5.9	5.8	5.8	83.0	109.8	146.7	111.3	133.0	122.3
Corn Belt [3]	80.1	85.4	103.5	104.8	101.8	109.3	5.5	5.7	5.6	5.8	89.6	111.1	136.4	108.9	123.1	101.3
Delaware	85.5	104.1	123.4	123.7	102.2	103.3	5.6	6.0	6.9	6.2	76.2	121.4	166.3	124.3	132.3	113.9
Maryland	84.7	90.4	97.7	109.3	102.9	109.6	6.3	5.9	6.3	6.5	84.1	110.6	128.5	114.0	124.7	112.3
Virginia	81.1	91.7	91.0	107.0	105.3	116.5	6.2	6.4	6.3	6.6	97.3	105.9	129.2	118.2	133.1	109.9
West Virginia	76.5	94.0	94.3	104.0	107.1	109.5	6.6	6.8	6.6	6.8	90.7	105.3	128.2	112.5	133.3	104.0
North Carolina	80.9	80.8	95.1	90.0	108.5	103.0	5.9	6.1	6.1	6.1	102.3	109.1	121.7	117.9	125.8	119.2
South Carolina	76.7	71.8	79.5	83.9	102.5	131.0	5.3	5.4	5.9	5.3	110.4	112.8	126.9	132.8	145.1	150.4
Georgia	97.4	89.7	96.4	88.1	108.5	111.9	5.6	5.6	5.9	5.6	113.2	114.1	119.8	120.7	146.8	144.4
Florida	83.8	90.2	102.4	95.3	100.8	95.0	5.4	5.5	5.2	5.3	106.7	110.8	131.2	123.5	119.7	139.1
Kentucky	78.6	91.2	108.4	107.0	112.2	99.9	5.9	6.3	6.0	6.2	114.6	116.5	143.1	122.5	137.4	102.4
Tennessee	70.0	84.6	92.7	102.0	116.4	114.9	6.0	6.1	6.1	6.1	103.8	115.3	134.4	129.3	147.5	102.8

Alabama	83.5	79.2	98.2	87.7	106.6	116.0	5.3	5.2	5.4	4.8	113.2	118.6	148.8	129.0	155.1	137.0
Mississippi	83.5	80.8	110.7	92.2	105.2	108.1	5.1	5.6	5.6	5.7	120.0	124.4	160.4	134.0	165.1	119.2
Arkansas	81.9	82.4	84.1	90.3	109.5	90.0	5.4	5.4	5.8	5.4	125.2	122.2	150.6	139.5	142.1	105.7
Louisiana	82.5	73.2	98.7	79.2	103.6	84.6	5.2	5.5	5.1	5.3	107.4	150.0	133.6	135.4	143.1	143.9
Oklahoma	79.7	69.5	79.9	98.3	105.4	112.0	5.8	5.5	5.6	5.8	120.2	101.6	170.6	136.6	148.9	125.9
Texas	111.6	62.5	95.2	107.1	110.1	115.9	5.7	5.7	5.7	5.5	129.5	107.7	197.5	144.7	160.0	118.5
Montana	82.7	79.4	86.3	91.9	100.4	136.4	6.5	6.1	5.8	5.1	149.6	101.1	156.4	109.4	170.6	94.8
Idaho	78.8	90.5	112.7	97.9	110.7	121.6	6.0	6.0	5.9	5.8	93.1	118.7	143.3	139.2	138.3	114.0
Wyoming	69.6	94.2	89.2	99.1	109.9	161.1	5.7	5.5	5.7	5.4	126.6	117.6	224.4	132.2	212.5	130.7
Colorado	81.3	92.7	89.5	85.8	116.6	112.2	5.8	6.0	5.6	5.5	101.6	113.5	167.4	114.7	123.0	107.3
New Mexico	78.9	53.0	89.7	116.7	137.0	105.8	4.7	5.8	5.2	6.3	158.8	105.3	252.2	148.8	156.8	87.0
Arizona	81.1	77.8	94.7	100.0	124.3	127.6	5.7	5.0	6.0	5.4	71.4	76.9	200.0	125.0	227.8	91.7
Utah	90.1	72.7	82.1	120.0	121.2	153.3	6.3	6.7	6.0	6.0	130.2	125.0	168.1	126.3	172.5	141.2
Nevada	67.5	76.3	103.6	122.2	84.2	123.2	6.3	5.8	5.7	5.4	134.5	119.2	194.7	137.5	112.5	141.2
Washington	78.0	79.0	93.9	115.0	102.3	130.2	6.6	6.6	6.0	6.5	92.1	116.9	156.1	125.8	151.2	118.6
Oregon	72.3	80.7	105.1	107.8	108.3	108.6	6.8	6.6	6.4	6.5	92.3	109.3	137.2	139.4	138.3	114.0
California	68.4	84.2	122.0	117.2	117.6	105.6	6.0	6.1	5.6	5.8	110.8	118.2	171.4	130.4	133.2	116.6
United States	81.2	84.6	101.7	102.4	103.0	110.2	5.6	5.8	5.6	5.8	104.5	111.9	139.0	113.2	129.9	105.8

Bureau of Agricultural Economics. Based on reports of about 140,000 farmers gathered in cooperation with the Post Office Department through the rural mail carriers. Periods covered: Dec. 1 to June 1 (spring), June 1 to Dec. 1 (fall).

[1] Total pigs saved divided by sows farrowed as reported by farmers.
[2] Intentions are as of the close of the preceding 6-month period—e. g., those for spring farrowing, 1928, were intentions expressed as of Dec. 1, 1927.
[3] The North Central States except North Dakota.

TABLE 357.—*Hogs: Receipts at principal public stockyards and all public stockyards, 1909–1927*

Year	Chicago	Denver	East St. Louis	Fort Worth	Kansas City	Omaha	South St. Joseph	South St. Paul	Sioux City	Total 9 markets [1]	All other stockyards reporting	Total all stockyards reporting
	Thousands	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
1909	6,619	242	2,473	868	3,093	2,135	1,694	725	1,077	18,926	(2)	(2)
1910	5,587	187	2,054	541	2,086	1,894	1,353	836	1,044	15,582	(2)	(2)
1911	7,103	220	3,124	556	3,168	2,367	1,922	911	1,349	20,720	(2)	(2)
1912	7,181	222	2,530	388	2,523	2,886	1,970	984	1,698	20,382	(2)	(2)
1913	7,571	247	2,584	404	2,568	2,543	1,869	1,257	1,533	20,576	(2)	(2)
1914	6,618	256	2,559	515	2,265	2,259	1,725	1,590	1,257	19,044	(2)	(2)
1915	7,652	344	2,592	464	2,531	2,643	1,698	2,155	1,761	21,840	14,373	36,213
1916	9,188	467	3,057	968	2,979	3,117	2,199	2,675	2,131	26,781	16,484	43,265
1917	7,169	352	2,706	1,062	2,277	2,797	1,920	1,928	2,149	22,360	15,682	38,042
1918	8,614	384	3,256	762	3,328	3,430	2,351	2,061	2,421	26,607	18,256	44,863
1919	8,672	368	3,651	588	3,141	3,179	2,126	2,190	2,322	26,237	18,232	44,469
1920	7,526	341	3,399	413	2,466	2,708	1,914	2,247	2,173	23,187	18,934	42,121
1921	8,148	334	3,330	382	2,205	2,665	1,785	2,210	1,739	22,798	18,303	41,101
1922	8,156	395	3,606	510	2,655	2,839	2,061	2,523	1,856	24,601	19,467	44,068
1923	10,460	495	4,831	486	3,615	3,649	2,457	3,338	2,989	32,320	23,010	55,330
1924	10,443	569	4,580	392	2,933	3,978	2,234	3,751	3,732	32,612	22,802	55,414
1925	7,996	467	3,512	312	2,067	3,355	1,673	3,637	3,396	26,415	17,514	43,929
1926	7,093	497	3,536	217	2,036	2,647	1,462	3,451	2,475	23,414	16,358	39,772
1927	7,724	457	3,710	338	1,904	2,631	1,425	3,105	2,322	23,616	17,795	41,411

Bureau of Agricultural Economics. Prior to 1915 receipts compiled from yearbooks of stockyard companies; subsequent figures compiled from data of the livestock and meat reporting service of the bureau. Receipts, 1900–1908, are available in 1924 Yearbook, p. 902, Table 500.

[1] Total of the rounded detail figures. [2] Figures not available prior to 1915.

TABLE 358.—*Hogs: Receipts at all public stockyards, 1915–1927*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
	Thousands	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
1915 [1]	3,959	3,449	3,199	2,487	2,768	2,874	2,368	2,024	1,966	2,457	3,728	4,934	36,213
1916 [1]	5,309	4,233	3,489	2,852	3,332	3,054	2,524	2,634	2,386	3,640	4,873	4,939	43,265
1917	5,084	3,933	3,369	2,961	3,264	2,791	2,563	1,853	1,615	2,676	3,941	3,992	38,042
1918	4,444	4,486	4,424	3,696	3,345	2,979	3,099	2,467	2,376	3,399	4,594	5,554	44,863
1919	5,855	4,412	3,643	3,648	3,831	3,773	2,974	2,095	2,397	3,121	3,740	4,980	44,469
1920	5,262	3,422	3,940	3,024	4,210	3,709	2,811	2,491	2,391	2,789	3,872	4,200	42,121
1921	4,700	4,009	3,386	3,229	3,328	3,579	2,727	2,656	2,655	3,214	3,687	3,931	41,101
1922	4,278	3,613	3,411	3,067	3,737	3,776	2,980	3,037	3,062	3,682	4,421	5,004	44,068
1923	5,306	4,492	4,927	4,318	4,524	4,204	4,181	3,714	3,607	4,816	5,416	5,825	55,330
1924	6,253	5,335	4,833	4,374	4,321	4,296	4,091	3,197	3,216	3,990	4,904	6,604	55,414
1925	6,105	4,558	3,528	3,247	3,283	3,507	2,798	2,549	2,741	3,390	3,843	4,380	43,929
1926	4,304	3,372	3,579	3,135	3,037	3,143	2,854	2,804	2,819	3,261	3,554	3,910	39,772
1927	4,252	3,308	3,754	3,142	3,613	3,775	3,046	3,042	2,565	3,039	3,666	4,209	41,411

Bureau of Agricultural Economics. Compiled from data of the livestock and meat reporting service of the bureau.

[1] Complete information for 1915 and 1916, particularly on disposition of stock, is not obtainable from many of these markets.

TABLE 359.—*Hogs: Receipts, local slaughter and stocker and feeder shipments at public stockyards, 1924–1927*

Market	Receipts				Local slaughter				Stocker and feeder shipments			
	1924	1925	1926	1927	1924	1925	1926	1927	1924	1925	1926	1927
	Thousands	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
Albany, N. Y	(1)	(1)	(1)	(1)	(1)	0	0	(1)	0	0	0	0
Amarillo, Tex	21	20	10	21	0	2	1	(1)	0	0	0	0
Atlanta, Ga	159	124	140	147	78	87	94	104	1	(1)	0	(1)
Augusta, Ga	7	4	3	6	6	4	3	6	(1)	(1)	(1)	0
Baltimore, Md	1,513	1,007	948	1,010	1,197	836	824	869	0	0	0	0
Boston, Mass	8	11	12	11	0	0	0	0	0	0	0	0
Buffalo, N. Y	1,656	1,131	969	1,067	849	539	401	496	0	(1)	(1)	(1)
Chattanooga, Tenn	19	20	19	21	19	20	19	20	0	0	0	0
Cheyenne, Wyo	170	196	239	194	0	0	0	0	0	0	0	0
Chicago, Ill	10,443	7,996	7,093	7,724	7,451	5,601	4,984	5,612	1	(1)	1	1
Cincinnati, Ohio	1,365	1,040	1,047	1,253	854	755	729	858	2	2	1	2
Cleveland, Ohio	1,269	785	701	776	987	547	527	597	0	0	0	0
Dallas, Tex	108	54	44	61	108	54	44	61	0	0	0	0
Dayton, Ohio	161	122	118	131	102	92	86	96	0	0	0	0
Denver, Colo	569	467	497	457	459	344	364	335	54	40	21	21
Detroit, Mich	556	439	427	518	350	311	299	308	1	1	1	(1)
East St. Louis, Ill	4,580	3,512	3,536	3,710	1,570	1,138	1,053	1,086	11	14	19	40
El Paso, Tex	28	26	34	43	25	23	25	31	1	2	3	4
Evansville, Ind	191	152	169	273	52	19	17	96	3	5	10	11
Fort Wayne, Ind	91	94	92	97	19	20	14	16	5	7	8	40
Fort Worth, Tex	392	312	217	338	349	295	204	317	6	11	4	6
Fostoria, Ohio	117	106	86	87	11	7	3	3	3	3	2	0
Indianapolis, Ind	2,865	2,067	1,771	1,841	1,577	1,131	1,054	1,139	15	13	23	15
Jacksonville, Fla	86	54	46	43	19	21	14	10	1	1	2	1
Jersey City, N. J	535	467	356	240	535	467	356	240	0	0	0	0
Kansas City, Mo	2,933	2,067	2,036	1,904	1,872	1,237	1,427	1,385	134	67	110	98
Knoxville, Tenn	52	38	24	29	26	25	24	29	0	0	0	0
La Fayette, Ind	142	122	110	114	68	60	62	57	1	2	4	3
Lancaster, Pa	81	66	80	69	27	29	29	38	0	0	0	0
Laredo, Tex	3	3	3	3	3	3	3	2	(1)	(1)	0	0
Los Angeles, Calif	270	217	199	220	268	211	197	218	2	6	2	2
Louisville, Ky	470	295	282	396	323	234	189	215	2	2	3	6
Marion, Ohio	82	54	57	50	25	16	10	3	2	1	4	2
Memphis, Tenn	80	66	55	55	69	56	42	38	5	7	9	14
Milwaukee, Wis	523	459	613	563	515	453	560	540	0	0	1	1
Montgomery, Ala	62	47	71	86	3	2	2	5	1	4	14	24
Moultrie, Ga	30	38	52	65	19	30	38	47	4	1	5	10
Muncie, Ind	0	74	88	94	0	31	28	29	0	2	6	4
Nashville, Tenn	312	243	219	206	186	154	116	60	1	1	(1)	0
Newark, N. J	605	533	460	570	605	533	460	570	(1)	0	(1)	(1)
New Orleans, La	50	30	33	42	42	25	27	33	2	4	4	5
New York, N. Y	1,199	928	924	1,115	1,199	928	924	1,115	0	0	0	0
North Salt Lake, Utah	475	380	337	328	69	50	36	51	1	2	(1)	(1)
Ogden, Utah	280	255	294	233	68	64	55	47	6	3	4	3
Oklahoma City, Okla	325	276	218	285	274	240	184	245	7	1	4	3
Omaha, Nebr	3,978	3,355	2,647	2,631	3,109	2,416	1,685	1,933	10	3	11	26
Pasco, Wash	9	9	4	7	0	0	0	(1)	0	0	0	(1)
Peoria, Ill	880	706	753	626	136	109	103	90	4	4	12	14
Philadelphia, Pa	375	278	252	269	355	265	237	257	0	0	0	0
Pittsburgh, Pa	3,038	2,312	2,059	2,136	674	520	432	488	0	0	0	0
Portland, Oreg	357	265	231	247	180	165	132	149	20	19	20	16
Pueblo, Colo	38	29	11	17	(1)	(1)	0	0	0	0	0	0
Richmond, Va	329	197	182	226	311	194	177	220	1	1	2	2
South St. Joseph, Mo	2,234	1,673	1,462	1,425	1,605	1,196	1,151	1,129	13	30	28	29
South St. Paul, Minn	3,751	3,637	3,451	3,105	2,919	2,824	2,573	2,176	127	160	375	358
South San Francisco, Calif	......	......	......	157	......	......	......	132	......	......	......	3
San Antonio, Tex	64	56	39	55	50	41	33	46	7	9	3	4
Seattle, Wash	275	256	208	183	270	249	199	173	3	7	8	8
Sioux City, Iowa	3,732	3,396	2,475	2,322	2,227	2,076	1,547	1,629	(1)	66	163	115
Sioux Falls, S. Dak	122	191	288	273	58	59	87	81	1	1	2	3
Spokane, Wash	133	166	102	133	94	103	44	59	12	10	10	8
Springfield, Ill	......	......	......	75	......	......	......	4	......	......	......	3
Springfield, Mo	......	......	......	77	......	......	......	13	......	......	......	6
Springfield, Ohio	91	109	124	105	8	3	5	7	0	5	11	0
Toledo, Ohio	154	126	112	97	26	14	45	27	0	(1)	1	2
Washington, D. C	193	140	119	138	193	140	119	138	0	0	0	0
Wichita, Kans	734	631	524	606	689	597	485	567	26	15	6	7
Discontinued [2]	44	(1)	0	5	6	(1)	0	2	0	0	0	2
Total	55,414	43,929	39,772	41,411	35,188	27,665	24,580	26,347	496	532	917	922

Bureau of Agricultural Economics. Compiled from data of the livestock and meat reporting service of the bureau. Earlier data in 1925 Yearbook, pp. 1120–1122.

Local slaughter represents number driven out from public stockyards for local slaughter.

[1] Not over 500.

[2] Includes only those markets which have been totally discontinued.

TABLE 360.—*Hogs: Monthly average live weight, Chicago, 1909–1927*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Average:	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*
1909–1913	215	219	224	230	234	235	237	240	234	225	219	217
1914–1920	217	223	228	231	232	233	240	244	241	225	214	214
1921–1925	230	232	240	242	240	242	252	258	258	242	228	226
1909	203	204	206	212	216	219	225	232	232	227	225	214
1910	210	213	218	227	239	242	246	255	259	253	232	224
1911	226	230	239	241	242	236	233	239	224	212	208	213
1912	212	217	218	227	232	235	239	240	235	226	222	223
1913	226	230	240	242	242	244	243	233	222	209	207	213
1914	216	224	233	233	236	237	244	248	242	229	218	226
1915	223	224	231	233	233	231	238	246	235	204	187	190
1916	195	204	214	219	220	226	231	232	223	210	195	193
1917	199	204	209	213	217	225	232	233	231	212	209	211
1918	216	231	238	242	238	235	243	243	247	233	226	223
1919	228	232	230	230	232	233	242	251	254	237	226	224
1920	239	239	244	248	245	243	252	258	258	247	234	230
1921	234	234	241	242	239	241	250	259	262	243	225	226
1922	231	236	244	246	244	247	259	268	265	243	231	234
1923	239	241	247	249	242	242	250	253	254	247	234	231
1924	227	229	237	239	239	241	251	255	254	235	220	214
1925	220	222	229	235	236	238	249	256	253	242	228	225
1926	231	235	245	244	247	255	271	281	267	232	217	220
1927	226	229	240	239	243	248	257	265	261	235	215	217

Bureau of Agricultural Economics. Figures for 1909–1919 compiled from Chicago Drovers Journal Yearbook; subsequent figures from data of the livestock and meat reporting service of the bureau and are the weighted average of packer and shipper purchases. Data for 1900–1908 are available in 1924 Yearbook, p. 909, Table 506.

TABLE 361.—*Feeder swine: Inspected shipments from public stockyards, 1927*

Origin and destination	January	February	March	April	May	June	July	August	September	October	November	December	Total
	Number	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*
Market origin:													
Denver, Colo	1,044	1,005	414	734	923	315	368	609	449	1,348	783	735	8,727
East St. Louis, Ill	3,128	5,007	6,149	4,544	4,767	4,419	1,477	2,177	2,245	1,269	1,191	1,143	37,516
Fort Worth, Tex	1,723	2,347	1,429	1,615	1,552	546	723	1,478	1,359	1,268	1,049	563	15,652
Indianapolis, Ind	1,400	1,152	1,047	1,000	1,510	2,317	680	549	349	705	1,708	1,943	14,360
Kansas City, Kans	9,873	10,551	9,569	9,354	7,916	6,217	2,443	1,842	3,805	8,809	9,254	6,179	85,812
Los Angeles, Calif	127	100	111	79	126	61	214	61	305	222	197	229	1,832
Oklahoma City, Okla	898	849	568	1,033	1,283	829	322	373	1,106	1,092	521	911	9,785
Omaha, Nebr	3,425	4,073	4,233	3,578	3,109	2,341	1,343	1,505	845	3,767	4,753	2,841	35,813
Portland, Oreg	1,169	1,480	2,517	585	1,359	1,266	1,301	1,235	1,010	1,161	871	2,062	16,016
Sioux City, Iowa	280	123	175	521	821	988	354	264	251	543	552	1,475	6,347
South St. Joseph, Mo	1,833	2,041	2,071	1,472	1,955	1,217	515	601	1,295	2,257	1,819	2,763	19,839
South St. Paul, Minn	37,629	29,132	26,522	19,319	15,366	7,407	5,076	7,786	9,768	33,138	63,914	46,173	301,230
Wichita, Kans	458	366	389	1,312	698	470	118	294	900	587	286	679	6,557
All other inspected	8,382	15,079	14,035	9,838	4,754	3,268	2,304	3,272	3,914	4,689	3,310	3,339	76,134
Total	71,369	73,305	69,229	54,984	46,139	31,661	17,238	22,046	27,601	60,855	90,208	71,035	635,670
State destination:													
California	406	100	432	79	126	61	214	385	305	222	710	595	3,635
Colorado	771	753	162	734	1,003	315	368	609	449	772	571	581	7,088
Illinois	9,229	8,416	8,931	8,138	4,163	5,325	1,863	1,420	2,071	3,821	6,668	4,271	64,316
Indiana	9,082	12,312	12,394	8,402	6,997	3,221	763	954	955	1,723	2,788	2,794	62,385
Iowa	13,014	10,574	7,007	5,661	3,924	2,510	370	1,253	1,889	8,628	13,306	9,869	78,005
Kansas	1,622	2,937	2,459	2,957	2,076	988	361	640	1,582	2,132	4,923	4,891	27,568
Michigan	1,470	708	2,150	1,866	2,456	1,750	1,040	1,053	1,545	2,906	4,264	1,640	22,848
Minnesota	5,129	4,357	4,702	2,507	2,616	2,241	1,609	1,977	4,190	3,980	5,328	3,615	42,251
Missouri	7,340	7,617	8,051	4,869	6,309	3,986	2,590	2,378	2,317	2,389	2,999	4,805	55,650
Nebraska	2,527	4,309	3,378	2,936	2,543	2,617	1,653	1,318	2,565	10,639	26,970	23,290	84,745
Ohio	8,253	5,109	4,160	5,066	3,090	1,250	409	535	36	1,563	3,456	2,434	35,361
Oklahoma	1,038	872	1,196	1,553	1,538	829	322	454	1,106	1,967	1,405	911	13,191
Oregon	1,012	1,339	2,496	477	1,302	1,149	1,272	1,060	935	1,328	627	1,970	14,967
Tennessee	376	988	342	745	325	170	549	553	193	381	246	696	5,564
Texas	2,241	2,464	935	1,434	1,465	900	1,034	1,785	2,283	1,232	999	1,113	17,885
ll other	7,859	10,450	10,400	7,006	5,951	4,334	2,818	5,666	5,178	17,172	14,948	7,560	99,342
Total [1]	71,369	73,305	69,229	54,984	46,139	31,661	17,238	22,046	27,601	60,855	90,208	71,035	635,670

Bureau of Agricultural Economics. Compiled from Bureau of Animal Industry inspection records.

[1] Totals include shipments to Alaska as follows: March, 34 head; April, 554 head; May, 255 head; June, 15 head; July, 3 head; August, 6 head; and September, 2 head.

TABLE 362.—*Feeder swine: Inspected shipments from public stockyards, 1920–1927*

Origin and destination	1920	1921	1922	1923	1924	1925	1926	1927
Market origin:	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*
Denver, Colo.	7,703	3,912	3,142	11,923	8,516	7,178	7,417	8,727
East St. Louis, Ill.	39,865	30,264	41,278	32,505	21,681	23,924	26,864	37,516
Fort Worth, Tex.	29,334	44,586	37,650	23,935	9,098	12,831	13,741	15,652
Indianapolis, Ind.	16,592	18,036	16,924	16,308	15,258	13,906	22,127	14,360
Kansas City, Kans.	147,826	77,971	151,485	265,458	118,823	55,224	96,919	85,812
Los Angeles, Calif.			1,605	12,840	1,261	4,471	1,371	1,832
Louisville, Ky.	9,942	10,806	18,319	2,080	1,569	1,875	2,779	6,060
Oklahoma City, Okla.	31,511	10,462	20,116	27,564	9,578	10,321	10,215	9,785
Omaha, Nebr.	11,572	7,311	7,042	15,149	21,267	15,433	15,217	35,813
Portland, Oreg.	11,466	10,772	16,494	18,929	20,446	17,969	20,127	16,016
Sioux City, Iowa	22,432	12,417	7,453	10,145	4,800	4,527	12,431	6,347
South St. Joseph, Mo.	5,409	946	352	1,562	2,498	14,842	22,471	19,839
South St. Paul, Minn.	105,135	97,116	111,537	136,142	117,794	157,152	356,568	301,230
Wichita, Kans.	25,384	10,556	16,247	31,270	26,505	13,923	5,029	6,557
All other inspected	66,036	35,519	43,630	36,416	34,497	41,982	53,337	70,124
Total	530,207	370,674	493,274	642,226	413,591	395,558	666,613	635,670
State destination:								
California			8,748	17,145	1,891	3,971	2,533	3,635
Colorado				10,128	5,611	6,456	5,898	7,088
Illinois	61,192	39,975	62,677	96,009	44,313	47,064	106,194	64,316
Indiana	28,915	27,716	46,580	24,751	20,116	33,787	101,155	62,385
Iowa	133,528	75,484	119,702	175,507	74,140	32,559	74,878	78,005
Kansas	44,409	32,250	29,148	26,032	16,627	17,725	16,042	27,568
Kentucky	5,757	11,062					10,880	23,642
Michigan			10,375	9,918	15,410	20,167	31,465	22,848
Minnesota	25,633	24,468	34,513	34,205	39,542	40,105	50,904	42,251
Missouri	63,566	36,456	46,399	69,874	36,471	31,681	45,796	55,650
Nebraska	23,787	14,987	22,901	62,811	34,104	23,888	20,060	84,745
Ohio	11,179	11,957	10,921	11,278	7,772	23,190	77,286	35,361
Oklahoma	37,329	24,116	23,998	13,561	10,965	10,071	9,567	13,191
Oregon	10,066	10,233	12,136	18,059	18,442	17,332	18,607	14,967
Tennessee				6,195	5,401	6,376	10,573	5,564
Texas	22,110	12,108	10,987	18,996	25,921	23,017	27,457	17,885
All other	62,736	40,862	54,189	46,802	56,077	57,592	56,605	75,700
Total [1]	530,207	370,674	493,274	642,226	413,591	395,558	666,613	635,670

Bureau of Agricultural Economics. Compiled from Bureau of Animal Industry inspection records.

[1] Includes other shipments as follows: 1923, 543 head to Alaska and 412 to Hawaii; 1924, 785 head to Alaska; 1925, 577 head to Alaska; 1926, 713 head to Alaska; 1927, 869 head to Alaska.

TABLE 363.—*Hogs: Estimated price per 100 pounds received by producers in the United States, 1910–1927*

Year beginning November	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Weighted av.
Average:	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1910–1913	6.96	6.73	6.85	6.94	7.02	7.17	6.89	6.84	7.02	7.39	7.45	7.20	7.01
1914–1920	11.19	10.65	10.73	10.93	11.56	11.88	11.97	11.73	12.16	12.57	12.36	11.89	11.53
1921–1925	8.08	7.89	8.31	8.76	9.34	9.22	9.12	9.13	9.22	9.56	9.62	9.65	8.92
1910	7.61	7.16	7.44	7.04	6.74	6.17	5.72	5.66	5.92	6.54	6.53	6.09	6.61
1911	5.86	5.72	5.74	5.79	5.94	6.78	6.79	6.65	6.64	7.11	7.47	7.70	6.43
1912	7.05	6.89	6.77	7.17	7.62	7.94	7.45	7.61	7.81	7.79	7.68	7.60	7.39
1913	7.33	7.16	7.45	7.75	7.80	7.80	7.60	7.43	7.72	8.11	8.11	7.43	7.60
1914	7.00	6.67	6.57	6.34	6.33	6.48	6.77	6.80	6.84	6.61	6.79	7.18	6.69
1915	6.35	6.02	6.32	7.07	7.86	8.21	8.37	8.21	8.40	8.61	9.22	8.67	7.61
1916	8.74	8.76	9.16	10.33	12.32	13.61	13.72	13.50	13.35	14.24	15.69	16.15	12.10
1917	15.31	15.73	15.26	15.03	15.58	15.76	15.84	15.37	15.58	16.89	17.50	16.50	15.78
1918	15.92	15.82	15.69	15.53	16.13	17.39	18.00	17.80	19.22	19.30	15.81	13.88	16.60
1919	13.36	12.66	13.36	13.62	13.59	13.73	13.44	13.18	13.65	13.59	13.98	13.57	13.43
1920	11.64	8.90	8.72	8.58	9.13	7.96	7.62	7.22	8.09	8.73	7.51	7.31	8.52
1921	6.66	6.52	6.89	8.24	9.08	8.83	9.05	9.11	9.12	8.54	8.23	8.33	8.10
1922	7.78	7.63	7.77	7.65	7.52	7.45	7.13	6.37	6.68	6.85	7.81	7.23	7.34
1923	6.66	6.39	6.59	6.54	6.63	6.70	6.68	6.55	6.60	8.54	8.50	9.45	7.06
1924	8.62	8.39	9.31	9.62	11.83	11.64	10.78	10.82	12.02	12.19	11.50	11.16	10.46
1925	10.66	10.51	10.99	11.76	11.65	11.49	11.97	12.80	12.69	11.66	12.07	12.06	11.63
1926	11.45	10.97	10.97	11.19	10.89	10.41	9.41	8.40	8.58	9.24	9.78	10.16	10.21
1927	8.99	8.14											

Bureau of Agricultural Economics. Based on returns from special price reporters.

TABLE 364.—*Hogs: Corn-hog ratios,*[1] *United States, averages 1910–1927*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Av.
	Bush.	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Bush.*	*Bush.*
1910	12.2	12.0	13.6	14.4	13.3	12.9	12.2	11.7	13.0	14.2	15.1	14.9	13.3
1911	15.3	14.4	13.7	12.1	10.7	9.8	9.4	9.9	9.9	9.3	9.2	9.3	11.1
1912	9.1	8.8	8.6	9.0	8.4	8.1	8.3	9.1	10.1	12 0	13.2	14.1	9.9
1913	13.6	13.9	14.4	14.4	12.7	12.3	12.1	11.1	10.2	10 4	10.5	10.3	12.2
1914	10.8	11 3	11.2	10.9	10.3	9.9	10.1	10.3	10.2	10.0	10.4	10.2	10.5
1915	9.5	8.6	8.4	8.5	8.7	8.7	8.7	8.5	9.2	10.8	10.6	10.1	9.2
1916	9.8	10.5	11.4	11.5	11.4	11.0	10.9	10.6	11.1	10 4	10.1	9.8	10.7
1917	9.9	10.5	11.5	10.3	8.8	8.3	7.4	7.7	9.0	10 1	11.2	12.0	9.7
1918	11.2	10.3	10.1	10.2	10.3	10.0	9.9	10.1	10 8	11.0	11.5	11 3	10.6
1919	11.1	11.3	11.2	11.1	10.8	10.2	10.5	10.2	9.3	9.7	9.2	9.2	10.3
1920	9.3	9.2	8.9	8.4	7.6	7.1	7.8	8.5	10.1	13.0	15.0	13.2	9.8
1921	13.5	13 5	14.3	13.0	12.5	11.0	13.1	14.8	14.0	15.9	16.0	15.2	14.0
1922	15.4	16.5	15.8	15.7	15.0	14.7	14.7	13.7	13.4	13.4	12.8	11.7	14.4
1923	11.1	10 9	10.2	9.8	8.8	7.9	7.5	7.7	8.5	8.8	8.2	9.0	9.0
1924	9.0	8.5	8.6	8.6	8.5	8.1	6.7	8.0	7.7	8.7	8.7	7.9	8.2
1925	8.3	8.4	10.6	11.2	10.0	9.7	11.5	11.4	11.6	13.4	14 3	14.9	11.3
1926	15.8	17.2	17.5	17.5	17.8	18.7	17.7	14.7	15.8	16.2	17 3	17.0	16.9
1927	17.1	16.8	16.7	15.9	12.9	9.4	9.3	9.5	10.3	11.6	12 2	10.8	12.7

Bureau of Agricultural Economics.

[1] Number of bushels of corn required to buy 100 pounds of live hogs, based on averages of farm prices of corn and of hogs for the month.

TABLE 365.—*Hogs: Average price per 100 pounds at Chicago, by months, 1901–1927*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Weighted av.
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1901	5.25	5.35	5.85	5.90	5.80	5.90	5.90	5.95	6.60	6.10	5.65	5.95	5.85
1902	6.20	6.10	6.35	6.95	7.00	7.35	7.65	7.15	7.55	7.00	6.30	6.20	6.85
1903	6.40	6.75	7.30	7.20	6.45	6.00	5.55	5.45	5.85	5.55	4.65	4.45	6.00
1904	4.90	5.15	5.35	5.10	4.65	5.05	5.40	5.30	5.75	5.40	4.80	4.50	5.15
1905	4.65	4.85	5.15	5.45	5.40	5.35	5.65	5.95	5.50	5.25	4.85	4.90	5.25
1906	5.40	6.00	6.30	6 55	6.45	6.55	6.65	6.25	6.25	6.40	6.20	6.25	6.25
1907	6.60	7.05	6.65	6.65	6.40	6.10	6.05	6.00	6.00	6.15	4 90	4.70	6.10
1908	4.40	4.45	5.00	5.85	5.50	5.80	6.50	6.55	6.85	5.95	5.80	5.65	5.70
1909	6.10	6.35	6.70	7.20	7.30	7.65	7.85	7.75	8.20	7.75	8.00	8.35	7.35
1910	8.55	9.05	10.55	9.90	9.55	9.45	8.75	8.35	8.90	8.50	7.60	7.65	8.90
1911	7.95	7.40	6.85	6.25	6.00	6.25	6.70	7.30	6.90	6.45	6.30	6.40	6.70
1912	6.25	6.20	7.10	7.80	7.65	7.50	7.65	8.25	8.45	8.75	7.75	7.40	7.55
1913	7.45	8.15	8.90	9.05	8.55	8.65	9.05	8.35	8.30	8.20	7.75	7.70	8.35
1914	8.30	8.60	8.70	8.65	8.45	8.20	8.70	9.00	8.85	7.65	7.50	7.10	8.30
1915	6.90	6.80	6.75	7.30	7.60	7.60	7.25	6.90	7.25	7.90	6.65	6.40	7.10
1916	7.20	8.20	9.65	9.75	9.85	9.70	9.80	10.30	10.70	9.80	9.60	9.95	9.60
1917	10.90	12.45	14.80	15.75	15.90	15.50	15.20	16.90	18.20	17.15	17.40	16.85	15.10
1918	16.30	16.65	17.10	17.45	17.45	16.60	17.75	19.00	19.65	17.70	17.70	17.55	17.45
1919	17.60	17.65	19.10	20.40	20.60	20.40	21.85	20.00	17.45	14.35	14.20	13.60	17.85
1920	14.97	14.55	14.94	14.79	14 28	14.68	14.84	14.74	15.88	14.17	11.83	9.55	13.91
1921	9.41	9.42	10.00	8.50	8.35	8.19	9.69	9.26	7.61	7.72	7.01	6.92	8.51
1922	8.02	9.90	10.43	10.31	10.48	10.33	9.70	8.51	8.75	8.80	8.07	8.18	9.22
1923	8.29	8.02	8.18	8.08	7.53	6.92	7.04	7.65	8.35	7.42	6.85	6.87	7.55
1924	7.10	7.06	7.35	7.36	7.34	7.04	7.68	9.38	9.57	9.91	8.97	9.38	8.11
1925	10.38	11.06	13.55	12.55	12.06	12.57	13.46	12.66	12.52	11.31	11.28	10.97	11.81
1926	12.02	12.45	12.20	12.33	13.55	14.01	12.51	11.48	12.03	12.72	11.80	11.57	12.34
1927	11.96	11.73	11.28	10.69	9.59	8.78	9.05	9.03	10.22	10.39	8.92	8.32	9.95

Bureau of Agricultural Economics. Figures prior to 1920 are general average hog prices as published in the Chicago Drovers Journal Yearbook; subsequent figures compiled from reports of packer and shipper purchases; such purchases do not include pigs, boars, stags, extremely rough sows or cripples.

TABLE 366.—*Hogs: Average price per 100 pounds at Chicago and Omaha, by months, 1920–1927*

Year and month	Chicago						Omaha					
	Butcher, bacon, and shipper hogs				Packing sows, smooth, 250 lbs. up	Average cost packer and shipper hogs	Butcher, bacon, and shipper hogs			Packing sows, smooth, 250 lbs. up	Stock pigs, 310 lbs. down, common to choice	Average cost packer and shipper hogs
	Heavyweight, 250 lbs. up, medium to choice	Medium weight, 200 to 250 lbs., medium to choice	Lightweight, 150 to 200 lbs., common to choice	Light lights, 130 to 150 lbs., common to choice			Heavyweight, 250 lbs. up, medium to choice	Medium weight, 200 to 250 lbs., medium to choice	Lightweight, 150 to 200 lbs., common to choice			
1920	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
January	14.97	15.09	15.14	14.81	14.38	14.97	14.77	14.81	14.68	14.59	12.54	14.62
February	14.29	14.63	14.82	14.59	13.38	14.55	13.99	14.14	14.05	13.71	13.21	13.97
March	14.63	15.30	15.58	15.13	13.35	14.94	13.81	14.65	14.77	13.12	12.64	14.21
April	14.67	15.38	15.62	15.20	13.13	14.79	13.80	14.48	14.65	13.07	13.45	14.12
May	14.05	14.66	14.84	14.48	12.79	14.28	13.67	14.06	14.23	13.11	12.68	13.79
June	14.67	15.17	15.10	14.39	13.51	14.68	14.06	14.42	14.52	13.52	11.47	14.02
July	15.03	15.69	15.60	15.01	13.95	14.84	14.51	15.03	14.93	14.00	12.32	14.28
August	14.96	15.37	15.50	15.19	14.06	14.74	14.37	14.77	14.80	13.88	12.84	14.18
September	16.00	16.43	16.50	16.09	15.11	15.88	15.46	15.87	15.95	15.06	13.78	15.28
October	14.32	14.59	14.40	11.02	13.55	14.17	13.69	13.94	13.99	13.32	12.90	13.66
November	12.31	12.41	12.27	12.16	11.71	11.83	11.88	12.04	11.95	11.64	11.32	11.23
December	9.61	9.69	9.72	9.71	9.32	9.55	9.32	9.46	9.30	8.90	8.49	9.20
Average	14.13	14.53	14.59	14.23	13.19	13.91	13.61	13.97	13.98	13.17	12.30	13.51
1921												
January	9.26	9.54	9.72	9.75	8.76	9.41	9.17	9.30	9.31	8.86	8.77	9.13
February	9.20	9.55	9.90	9.94	8.45	9.42	8.54	9.00	9.22	8.06	8.90	8.76
March	9.64	10.14	10.65	10.53	8.75	10.00	9.36	9.71	9.86	8.73	9.48	9.50
April	8.34	8.69	8.96	8.96	7.46	8.50	7.73	8.17	8.37	7.04	8.50	7.80
May	8.29	8.49	8.56	8.46	7.63	8.35	7.74	8.04	8.14	7.25	7.87	7.78
June	8.23	8.35	8.39	8.33	7.80	8.19	7.66	7.88	7.94	7.24	7.76	7.70
July	9.96	10.33	10.47	10.34	9.04	9.69	9.30	9.53	9.59	8.71	8.36	9.05
August	9.47	10.07	10.25	9.95	8.32	9.26	8.84	9.31	9.48	8.04	8.58	8.47
September	8.03	8.46	8.39	8.05	6.87	7.61	7.45	7.77	7.94	6.61	7.54	6.84
October	8.04	8.26	8.17	8.05	7.04	7.72	7.36	7.59	7.72	6.57	7.59	6.87
November	7.08	7.12	7.12	7.30	6.56	7.01	6.62	6.73	6.75	6.02	6.98	6.41
December	6.90	7.05	7.25	7.43	6.14	6.92	6.43	6.59	6.65	5.60	6.67	6.47
Average	8.54	8.84	8.99	8.92	7.74	8.51	8.02	8.30	8.41	7.39	8.08	7.92
1922												
January	7.78	8.01	8.27	8.41	6.88	8.02	7.41	7.53	7.65	6.31	7.48	7.51
February	9.63	9.84	10.03	9.96	8.73	9.90	9.21	9.37	9.46	8.22	9.26	9.33
March	10.39	10.58	10.72	10.37	9.61	10.43	9.94	10.04	10.13	9.11	9.97	9.98
April	10.31	10.50	10.59	10.34	9.56	10.31	9.94	10.04	10.11	9.39	9.72	9.00
May	10.49	10.65	10.76	10.53	9.65	10.48	10.15	10.24	10.31	9.53	9.88	10.12
June	10.51	10.67	10.78	10.56	9.55	10.33	10.00	10.16	10.28	9.25	9.81	9.99
July	10.32	10.59	10.78	10.53	8.80	9.70	9.66	10.13	10.26	8.48	9.48	9.09
August	8.88	9.50	9.84	9.66	7.54	8.51	8.53	8.94	9.22	7.50	8.56	7.88
September	9.10	9.66	9.86	9.46	7.68	8.75	8.69	9.00	9.28	7.57	7.96	7.91
October	9.17	9.52	9.38	9.20	8.15	8.80	8.64	8.94	9.01	7.80	8.19	8.15
November	8.25	8.29	8.23	8.27	7.69	8.07	7.83	7.91	7.77	7.29	7.37	7.60
December	8.23	8.27	8.30	8.30	7.73	8.18	7.94	7.97	7.84	7.33	7.18	7.81
Average	9.42	9.67	9.80	9.63	8.46	9.22	9.00	9.19	9.28	8.15	8.74	8.92
1923												
January	8.21	8.36	8.55	8.51	7.54	8.29	8.07	8.11	8.07	7.39	7.49	7.99
February	7.96	8.14	8.31	8.22	7.18	8.02	7.82	7.86	7.86	7.12	7.03	7.75
March	8.15	8.32	8.44	8.22	7.49	8.18	7.98	7.97	7.88	7.40	6.62	7.86
April	8.03	8.26	8.26	7.72	7.14	8.08	7.76	7.78	7.70	6.93	6.35	7.70
May	7.46	7.67	7.66	7.25	6.67	7.53	7.13	7.19	7.14	6.19	5.51	7.04
June	6.94	7.06	7.02	6.82	6.16	6.92	6.50	6.58	6.48	5.68	4.97	6.39
	250 to 350 lbs.		160 to 200 lbs.	130 to 160 lbs.	All weights		250 to 350 lbs.		160 to 200 lbs.	All weights	Feeder and stocker pigs (70–130 lbs.), common to choice	
July	7.18	7.40	7.32	7.17	6.26	7.04	6.83	6.98	6.79	6.08	4.92	6.62
August	7.91	8.23	7.98	7.80	6.61	7.65	7.60	7.77	7.57	6.74	5.43	7.19
September	8.50	8.80	8.52	8.23	7.62	8.35	8.12	8.32	8.10	7.55	6.10	7.83
October	7.64	7.68	7.41	6.95	6.86	7.42	7.15	7.17	7.00	6.79	5.82	6.96
November	7.04	7.04	6.76	6.25	6.59	6.85	6.60	6.61	6.50	6.26	5.23	6.53
December	7.03	6.97	6.74	6.46	6.60	6.87	6.72	6.71	6.45	6.42	5.06	6.61
Average	-------	7.83	-------	-------	-------	7.55	-------	7.42	-------	-------	-------	7.22

TABLE 366.—*Hogs: Average price per 100 pounds at Chicago and Omaha, by months, 1920–1927*—Continued

Year and month	Chicago						Omaha					
	Butcher, bacon, and shipper hogs						Butcher, bacon, and shipper hogs					
	Heavyweight, 250 to 350 lbs., medium to choice	Medium weight, 200 to 250 lbs., medium to choice	Lightweight, 160 to 200 lbs., common to choice	Light lights, 130 to 160 lbs., common to choice	Packing sows, smooth, all weights	Average cost packer and shipper hogs	Heavyweight, 250 to 350 lbs., medium to choice	Medium weight, 200 to 250 lbs., medium to choice	Lightweight, 160 to 200 lbs., common to choice	Packing sows, smooth, all weights	Feeder and stocker pigs (70–130 lbs.), common to choice	Average cost packer and shipper hogs
1924	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
January	7.23	7.18	7.01	6.69	6.73	7.10	6.91	6.85	6.64	6.63	5.19	6.79
February	7.18	7.14	7.00	6.52	6.38	7.06	6.86	6.74	6.46	6.38	4.81	6.71
March	7.41	7.40	7.27	6.80	6.71	7.35	7.13	7.02	6.75	6.52	4.91	7.03
April	7.42	7.41	7.26	6.67	6.86	7.36	7.08	7.04	6.79	6.61	5.65	7.01
May	7.46	7.40	7.23	6.65	6.85	7.34	7.04	6.94	6.63	6.52	5.43	6.93
June	7.26	7.18	6.90	6.32	6.57	7.04	6.84	6.69	6.37	6.28	4.99	6.69
July	8.26	8.29	8.07	7.54	7.44	7.68	7.78	7.69	7.48	7.20	5.35	7.25
August	9.82	9.96	9.64	9.15	8.71	9.38	9.20	9.30	9.08	8.47	6.98	8.73
September	9.84	10.00	9.61	8.88	8.85	9.57	9.37	9.48	9.19	8.80	6.67	9.01
October	10.62	10.58	9.85	8.83	9.60	9.91	9.97	9.96	9.37	9.55	6.99	9.74
November	9.56	9.36	8.52	7.48	8.90	8.97	8.96	8.86	8.21	8.53	5.96	8.65
December	10.11	9.69	8.89	7.89	9.50	9.38	9.60	9.45	8.93	9.20	5.99	9.26
Average	8.51	8.47	8.10	7.45	7.76	8.11	8.06	8.00	7.66	7.56	5.74	7.80
1925												
January	10.71	10.33	9.81	9.00	10.26	10.38	10.36	10.17	9.82	9.94	6.94	10.16
February	11.26	11.02	10.73	10.08	10.57	11.06	10.93	10.82	10.46	10.40	7.74	10.81
March	13.74	13.68	13.46	12.75	12.92	13.55	13.45	13.38	12.99	12.87	9.61	13.28
April	12.58	12.64	12.52	12.15	11.37	12.55	12.10	12.08	11.93	11.51	9.83	11.94
May	12.15	12.24	12.15	11.87	11.08	12.06	11.70	11.74	11.68	11.14	10.15	11.61
June	12.60	12.56	12.26	11.78	11.60	12.57	12.25	12.21	12.07	11.47	10.81	12.14
					Rough and smooth					Rough and smooth	Medium to choice	
July	13.60	13.77	13.62	13.37	12.11	13.46	13.17	13.21	13.09	12.00	[1] 11.23	12.87
August	12.99	13.23	12.89	12.72	11.57	12.66	12.58	12.87	12.94	11.52	--------	12.21
September	12.82	13.11	12.64	12.40	11.18	12.52	12.23	12.44	12.43	11.11	--------	11.78
October	11.58	11.67	11.44	11.32	9.85	11.31	11.06	11.23	11.19	9.80	--------	10.80
November	11.37	11.46	11.30	11.27	10.13	11.28	11.07	11.14	11.12	10.18	10.90	10.92
December	10.86	11.09	11.14	11.31	9.31	10.97	10.67	10.75	10.84	9.50	10.87	10.62
Average	12.19	12.23	12.00	11.67	--------	11.81	11.80	11.84	11.71	--------	--------	11.59
1926												
January	11.83	12.12	12.20	12.27	10.36	12.02	11.70	11.86	12.03	10.49	11.82	11.76
February	12.00	12.56	12.86	12.94	10.64	12.45	11.69	12.20	12.61	10.48	12.77	11.98
March	11.77	12.46	12.96	13.01	10.58	12.20	11.36	12.04	12.58	10.00	13.02	11.72
April	11.95	12.62	13.14	13.28	10.73	12.33	11.72	12.22	12.56	10.28	13.11	11.88
May	13.34	13.74	13.71	13.80	12.27	13.55	13.01	13.27	13.40	11.88	13.70	13.08
June	14.00	14.41	14.33	14.39	12.58	14.01	13.71	13.96	14.16	12.20	14.24	13.67
July	13.02	13.63	13.87	13.90	11.00	12.51	12.23	12.88	13.45	10.72	13.23	11.77
August	12.12	12.99	13.20	13.19	10.20	11.48	11.49	12.38	12.82	10.02	11.43	10.82
September	12.66	13.51	13.41	13.09	10.76	12.03	12.22	12.98	13.19	10.53	11.39	11.55
October	13.18	13.54	13.26	12.48	11.12	12.72	12.19	12.74	12.28	10.36	10.94	11.62
November	12.00	12.05	12.62	11.74	10.68	11.80	11.44	11.59	11.37	10.44	10.79	11.32
December	11.65	11.63	11.56	11.50	10.68	11.57	11.34	11.36	11.16	10.70	10.60	11.26
Average	12.46	12.94	13.09	12.97	10.97	12.34	12.01	12.46	12.63	10.68	12.25	11.92
1927												
January	11.89	11.97	11.99	11.96	10.97	11.96	11.61	11.66	11.61	10.85	11.12	11.61
February	11.70	11.89	11.96	11.88	10.74	11.73	11.33	11.44	11.51	10.74	11.68	11.37
March	11.10	11.49	11.69	11.64	10.24	11.28	10.75	11.05	11.25	9.84	11.39	10.92
April	10.52	10.81	11.03	10.98	9.50	10.69	10.08	10.37	10.52	9.10	10.67	10.19

[1] 2-week average in 5-week month.

TABLE 366.—*Hogs: Average price per 100 pounds at Chicago and Omaha, by months, 1920–1927*—Continued

Year and month	Chicago						Omaha					
	Butcher, bacon, and shipper hogs				Packing sows, smooth, all weights	Average cost packer and shipper hogs	Butcher, bacon, and shipper hogs			Packing sows, smooth, all weights	Feeder and stocker pigs (70–130 lbs.), common to choice	Average cost packer and shipper hogs
	Heavyweight, 250 to 350 lbs., medium to choice	Medium weight, 200 to 250 lbs., medium to choice	Lightweight, 160 to 200 lbs., common to choice	Light lights, 130 to 160 lbs., common to choice			Heavyweight, 250 to 350 lbs., medium to choice	Medium weight, 200 to 250 lbs., medium to choice	Lightweight, 160 to 200 lbs., common to choice			
1927	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
May	9.52	9.83	9.88	9.80	8.54	9.59	9.08	9.34	9.46	8.14	9.63	9.12
June	8.79	9.06	9.06	8.74	7.71	8.78	8.52	8.75	8.76	7.58	7.99	8.46
			Medium to choice	Medium to choice					Medium to choice			
July	9.16	9.80	9.94	9.68	7.83	9.05	8.89	9.61	9.72	7.70	7.92	8.60
August	9.32	10.14	10.25	9 90	7.83	9.03	8.99	9.75	10.08	7.81	8.45	8.45
September	10.88	11.39	11.21	10.42	9.56	10.22	10 59	10.90	10.79	9.68	9.21	10.03
October	11.12	11.22	10.86	9.98	9.51	10.39	10.46	10.73	10.32	9.42	9.78	9.97
November	9.45	9.33	8.90	8.32	8.00	8.92	8.86	9 04	8.65	7.75	8.93	8 62
December	8.53	8.47	8.17	7.87	7.56	8.32	8.21	8.21	7.93	7.29	7.57	8 12
Average	10.16	10.45	-------	-------	9.00	9.95	9.78	10.07	-------	8.82	9.53	9.62

Bureau of Agricultural Economics. Compiled from data of the livestock and meat-reporting service of the bureau.

TABLE 367.—*Hogs: Monthly slaughter under Federal inspection, 1907–1927*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
	Thousands	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
1907	3,410	2,921	2,665	2,667	3,317	3,241	2,929	2,301	1,988	2,219	2,135	3,094	32,885
1908	4,961	3,890	3,111	2,304	3,088	3.094	2,416	2,231	2,231	3,368	3,803	4,147	38,643
1909	3,876	2,653	3,013	2,343	2,629	2,719	2,097	1,822	1,955	2,397	2,800	3,090	31,395
1910	2,693	2,324	1,891	1,778	2,206	2,612	1,988	1,824	1,564	1,851	2,456	2,827	26,014
1911	2,742	2,633	2,973	2,589	3,008	3,462	2,560	2,032	2,172	2,720	3,639	3,603	34,133
1912	4,147	3,302	2,700	2,412	2,844	2,835	2,354	1,875	1,701	2,455	3,020	3,407	33,053
1913	3,708	2,844	2,334	2,487	3,046	3,057	2,557	2,268	2,133	2,681	3,165	3,919	34,199
1914	3,489	2,723	2,548	2,312	2,569	2,926	2,260	1,799	1,907	2,682	3,047	4,271	32,532
1915	4,274	3,885	3,446	2,563	2,869	3,246	2,493	2,041	1,890	2,494	3,739	5,442	38,381
1916	5,387	4,276	3,430	2,853	3,275	3,163	2,530	2,517	2,287	3,327	4,771	5,267	43,084
1917	4,629	3,484	2,985	2,645	3,084	2,685	2,411	1,705	1,322	2,195	3,043	3,723	33,910
1918	3,961	3,998	3,926	3,290	3,092	2,783	2,940	2,283	1,980	3,018	4,280	5,662	41,214
1919	5,846	4,266	3,443	3,208	3,743	3,728	2,884	1,949	1,997	2,686	3,270	4,790	41,812
1920	5,079	3,104	3,482	2,590	3,585	3,566	2,644	2,191	1,988	2,487	3,329	3,985	38,019
1921	4,347	3,799	3,047	3,003	3.274	3,618	2,821	2,530	2,422	2,866	3,447	3,807	38,982
1922	3,985	3,480	3,350	2,946	3,716	4,046	3,104	2,888	2,747	3,332	4,318	5,201	43,114
1923	5,134	4,231	4,838	4,179	4,325	4,303	3,983	3,556	3,212	4,328	5,341	5,904	53,334
1924	5,911	5,006	4,536	4,073	4,278	4,288	4,114	3,070	2,857	3,498	4,641	6,600	52,873
1925	5,979	4,447	3,299	3,037	3,186	3,732	2,819	2,452	2,598	3,314	3,646	4,533	43,043
1926	4,501	3,351	3,562	3,105	3,131	3,430	3,127	2,834	2,616	2,976	3,610	4,394	40,636
1927	4,514	3,395	3,837	3,330	3,766	4,253	3,431	3,050	2,534	2,969	3,688	4,869	43,633

Bureau of Animal Industry.

TABLE 368.—*Hogs: Statement of livestock and meat situation, 1921–1927*

PORK, INCLUDING LARD

Item	Unit	1921	1922	1923	1924	1925	1926	1927
Federally inspected slaughter.	Thousands	38, 982	43, 114	53, 334	52, 873	43, 043	40, 636	43, 633
Average live weight	Pounds	226. 28	225. 95	225. 33	222. 31	225. 50	235. 06	233. 33
Total live weight	1,000 pounds	8, 820, 928	9, 741, 524	12, 017, 684	11, 754, 115	9, 706, 167	9, 551, 947	10, 180, 995
Average live cost per 100 pounds.	Dollars	8. 57	9. 31	7. 59	8. 04	11. 79	12. 47	10. 06
Total live cost	1,000 dollars	755, 953	906, 936	912, 142	945, 031	1, 144, 357	1, 191, 128	1, 024, 208
Carcasses condemned	Thousands	141	175	228	203	159	169	151
Number passed for food.	do	38, 842	42, 938	53, 106	52, 670	42, 884	40, 467	43, 482
Average dressed weight.	Pounds	173. 18	172. 76	172. 93	167. 30	170. 46	179. 51	177. 93
Total dressed weight [1]	1,000 pounds	6, 722, 549	7, 419, 311	9, 182, 135	8, 819, 555	7, 322, 710	7, 272, 534	7, 730, 761
Imports, fresh pork	do	982	818	1, 101	5, 683	7, 235	9, 156	14, 524
Storage Jan. 1:								
Pork	do	533, 980	415, 096	570, 510	708, 869	647, 364	472, 219	472, 757
Lard	do	59, 319	47, 541	48, 808	49, 340	61, 049	42, 478	49, 992
Total supply	do	7, 316, 830	7, 882, 766	9, 802, 553	9, 583, 447	8, 038, 358	7, 796, 388	8, 268, 034
Storage Dec. 31:								
Pork	do	415, 096	570, 510	708, 869	647, 364	472, 219	472, 757	523, 425
Lard	do	47, 541	48, 808	49, 340	61, 049	42, 478	49, 992	54, 855
Exports:								
Pork [2]	do	737, 756	699, 496	928, 224	702, 337	519, 435	402, 665	282, 610
Lard [3]	do	892, 892	787, 447	1, 059, 510	971, 460	707, 683	717, 077	701, 699
Pork and lard:								
Apparent domestic consumption.	do	5, 223, 544	5, 776, 506	7, 056, 610	7, 201, 237	6, 296, 544	6, 153, 896	6, 705, 445
Apparent per capita consumption.	Pounds	48. 17	52. 56	63. 18	63. 32	54. 57	52. 54	56. 52

LARD, RENDERED

Item	Unit	1921	1922	1923	1924	1925	1926	1927
Average yield per 100 pounds live weight.	Pounds	15. 71	16. 22	16. 49	16. 45	15. 02	15. 89	15. 36
Total production from inspected slaughter.	1,000 pounds	1, 379, 300	1, 575, 137	1, 971, 245	1, 922, 629	1, 451, 743	1, 513, 385	1, 556, 747
Storage Jan. 1	do	59, 319	47, 541		49, 340	61, 049	42, 478	49, 992
Total supply	do	1, 438, 619	1, 622, 678	2, 020, 053	1, 971, 969	1, 512, 792	1, 555, 863	1, 606, 739
Storage Dec. 31	do	47, 541	8, 808	49, 340	61, 049	42, 478	49, 992	54, 855
Exports, lard and neutral lard.	do		787, 447	1, 059, 510	971, 460	707, 683	717, 077	701, 699
Apparent domestic consumption.	do	498, 185	786, 423	911, 203	939, 460	762, 631	788, 794	850, 185
Apparent per capita consumption.	Pounds	4. 59	7. 16	8. 16	8. 26	6. 61	6. 73	7. 17

Bureau of Agricultural Economics.

[1] Includes dressed pork and dressed lard, except killing fats.
[2] Exports and reexports of fresh, cured, and canned pork.
[3] Exports and reexports of lard and neutral lard.

TABLE 369.—*Lard: Total stocks in cold-storage warehouses and meat-packing establishments, United States, 1916–1927* [1]

Year	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sept. 1	Oct. 1	Nov. 1	Dec. 1
	Thousands	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
Average:												
1916–1920	73, 142	94, 772	100, 619	99, 546	105, 594	99, 815	115, 129	120, 532	109, 518	83, 522	56, 703	54, 165
1921–1925	53, 211	73, 570	91, 725	103, 458	117, 510	131, 313	156, 178	155, 350	124, 980	77, 777	37, 957	35, 851
1916	63, 304	92, 342	111, 897	97, 237	108, 731	85, 113	87, 127	95, 991	82, 028	71, 570	56, 929	58, 950
1917	80, 977	86, 208	88, 460	65, 179	61, 640	72, 365	95, 197	112, 249	102, 172	69, 929	37, 095	44, 367
1918	54, 539	59, 310	65, 355	89, 854	103, 373	106, 194	107, 871	102, 411	104, 668	90, 398	76, 124	81, 676
1919	104, 274	138, 353	125, 410	112, 469	112, 409	83, 096	92, 132	100, 478	87, 947	76, 456	66, 036	49, 147
1920	62, 614	97, 649	111, 975	132, 993	141, 819	152, 307	193, 316	191, 531	170, 774	109, 258	47, 329	36, 683
1921	59, 319	83, 549	117, 690	128, 614	152, 428	181, 992	204, 301	194, 490	149, 886	85, 115	48, 850	42, 001
1922	47, 541	61, 202	61, 297	86, 031	96, 055	123, 798	154, 254	143, 084	119, 755	75, 338	36, 750	32, 506
1923	48, 808	56, 266	59, 101	66, 743	85, 251	84, 530	123, 896	143, 579	115, 860	72, 608	35, 225	35, 327
1924	49, 340	54, 130	68, 610	85, 722	102, 317	127, 949	152, 520	149, 672	124, 676	84, 198	31, 706	35, 713
1925	61, 049	112, 704	151, 927	150, 182	151, 499	138, 295	145, 919	145, 924	114, 724	71, 626	37, 256	33, 710
1926	42, 478	64, 187	76, 145	93, 108	98, 365	106, 824	120, 527	153, 572	151, 233	105, 558	72, 355	46, 744
1927	49, 992	69, 576	77, 103	92, 069	99, 611	111, 976	147, 318	179, 136	167, 018	118, 174	72, 121	46, 154

Bureau of Agricultural Economics. Compiled from reports from cold-storage establishments.

[1] Lard includes all prime steam, kettle-rendered, neutral, and other pure lards. It does not include lard substitutes nor compounds.

TABLE 370.—*Pork: Stocks in cold-storage warehouses and meat-packing establishments, United States, 1916–1927*

DRY SALT CURED AND IN PROCESS OF CURE

Year	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sept. 1	Oct. 1	Nov. 1	Dec. 1
	Thousands	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
Average:												
1916–1920	243, 893	313, 699	345, 319	355, 433	356, 364	349, 408	323, 973	311, 047	273, 409	226, 795	181, 909	186, 673
1921–1925	128, 806	158, 231	179, 655	188, 577	190, 726	192, 211	206, 048	200, 015	178, 070	136, 806	98, 121	93, 238
1916	145, 661	194, 053	226, 910	206, 703	202, 392	206, 008	202, 088	205, 251	183, 194	140, 908	118, 958	142, 858
1917	200, 998	228, 424	259, 059	234, 396	219, 819	213, 802	224, 813	231, 905	195, 678	143, 319	110, 652	150, 882
1918	252, 934	341, 422	402, 734	448, 114	471, 809	493, 795	402, 549	370, 203	333, 472	283, 572	247, 194	283, 002
1919	357, 254	471, 747	435, 661	430, 205	425, 411	402, 652	381, 736	366, 547	338, 270	332, 786	281, 930	242, 224
1920	262, 620	332, 848	402, 229	457, 745	462, 389	430, 782	408, 681	381, 328	316, 433	233, 389	150, 812	114, 400
1921	144, 997	202, 909	251, 893	255, 390	246, 443	240, 610	250, 752	231, 511	200, 291	149, 974	108, 611	96, 731
1922	111, 071	128, 690	139, 281	145, 183	142, 030	157, 689	186, 948	179, 856	165, 668	122, 783	85, 671	83, 017
1923	121, 125	155, 922	178, 024	206, 429	227, 728	214, 453	217, 862	221, 716	191, 711	146, 974	108, 850	110, 824
1924	148, 121	167, 507	178, 258	192, 934	191, 882	206, 009	212, 158	202, 618	180, 127	135, 702	81, 460	78, 871
1925	118, 718	136, 125	150, 819	142, 950	145, 548	142, 292	162, 518	164, 374	152, 555	128, 599	106, 011	96, 746
1926	119, 617	138, 005	144, 071	151, 286	140, 324	136, 801	148, 164	168, 882	172, 766	143, 572	98, 521	66, 765
1927	68, 203	86, 135	101, 156	124, 676	129, 637	143, 143	173, 256	185, 920	178, 107	140, 420	100, 922	77, 240

PICKLED,[1] CURED, AND IN PROCESS OF CURE

Year	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sept. 1	Oct. 1	Nov. 1	Dec. 1
Average:												
1916–1920	278, 118	339, 742	380, 567	382, 009	382, 685	387, 887	394, 113	378, 975	330, 193	269, 231	225, 930	235, 713
1921–1925	351, 495	385, 108	426, 738	432, 850	434, 109	424, 442	422, 583	399, 780	370, 052	314, 821	271, 438	293, 931
1916	230, 881	208, 939	350, 750	351, 051	337, 464	326, 183	359, 300	350, 570	303, 399	251, 004	209, 061	251, 519
1917	307, 478	348, 269	378, 847	362, 931	381, 236	403, 185	412, 810	403, 704	328, 943	252, 152	192, 884	204, 007
1918	269, 003	322, 004	369, 014	402, 377	406, 191	397, 486	372, 347	365, 941	315, 517	249, 827	233, 148	242, 076
1919	303, 763	392, 260	435, 197	431, 714	434, 671	440, 939	422, 387	384, 764	341, 724	297, 712	239, 719	226, 893
1920	279, 467	337, 238	369, 026	361, 973	353, 864	371, 593	403, 719	389, 896	361, 381	295, 460	254, 838	252, 270
1921	294, 993	316, 328	376, 376	367, 553	355, 041	366, 291	366, 346	346, 623	320, 190	257, 244	212, 528	221, 345
1922	252, 822	284, 487	321, 950	347, 276	348, 305	363, 395	391, 474	385, 692	369, 187	313, 517	278, 812	302, 7[illegible]
1923	377, 107	412, 806	451, 279	469, 130	499, 119	483, 673	473, 569	449, 441	413, 798	367, 374	325, 456	384, 604
1924	434, 030	468, 892	500, 784	512, 190	500, 683	483, 372	473, 914	443, 918	408, 928	351, 485	283, 710	299, 868
1925	398, 521	443, 025	483, 302	468, 099	467, 395	425, 481	407, 610	373, 227	338, 156	284, 485	256, 684	261, 128
1926	294, 642	319, 726	345, 661	346, 049	338, 905	320, 305	333, 305	340, 687	330, 326	293, 106	257, 726	266, 222
1927	306, 904	352, 681	392, 642	420, 037	435, 967	432, 965	450, 172	440, 744	407, 239	341, 460	289, 553	276, 916

FROZEN

Year	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sept. 1	Oct. 1	Nov. 1	Dec. 1
Average:												
1916–1920	50, 702	80, 496	103, 516	112, 200	110, 797	116, 101	123, 485	116, 731	85, 360	54, 844	40, 144	39, 028
1921–1925	94, 863	141, 329	175, 953	190, 727	186, 970	180, 415	176, 658	151, 665	110, 390	68, 511	42, 663	45, 858
1916	44, 194	63, 376	88, 604	88, 344	77, 812	83, 195	82, 571	85, 845	63, 420	38, 851	23, 988	32, 015
1917	50, 564	66, 062	63, 352	64, 996	74, 728	77, 534	91, 562	96, 648	72, 286	39, 767	25, 347	23, 504
1918	41, 663	61, 659	104, 630	116, 548	117, 780	118, 601	117, 976	108, 220	71, 385	46, 593	36, 968	34, 750
1919	61, 539	104, 708	128, 897	142, 189	139, 205	144, 212	155, 263	131, 137	90, 510	61, 417	47, 271	44, 864
1920	55, 551	106, 677	132, 095	148, 922	144, 453	156, 963	170, 054	161, 804	129, 197	87, 592	67, 148	60, 007
1921	93, 990	150, 594	208, 889	219, 964	200, 706	194, 486	182, 163	149, 435	103, 486	64, 682	38, 517	37, 513
1922	51, 203	71, 722	86, 219	98, 765	103, 907	114, 571	128, 962	117, 903	84, 815	46, 796	30, 688	33, 774
1923	72, 278	120, 196	154, 377	189, 115	213, 224	210, 645	217, 074	195, 002	148, 753	98, 795	71, 040	82, 068
1924	126, 718	164, 491	199, 044	227, 284	215, 767	201, 728	186, 566	164, 049	121, 816	77, 986	42, 561	48, 781
1925	130, 125	199, 642	231, 234	218, 508	201, 246	180, 645	168, 527	131, 935	93, 078	54, 294	29, 910	27, 153
1926	57, 960	98, 311	120, 115	129, 259	124, 569	117, 366	120, 707	133, 104	119, 994	77, 673	49, 376	55, 241
1927	97, 650	150, 255	177, 876	193, 733	204, 608	211, 742	220, 847	214, 607	181, 072	126, 887	76, 044	65, 666

Bureau of Agricultural Economics. Compiled from reports from cold-storage establishments.

[1]Pickled pork includes sweet-pickled, plain-brine, and barreled pork.

TABLE 371.—*Pork and pork products: International trade, average 1911–1913, annual 1923–1926*

Country	Year ended Dec. 31									
	Average, 1911–1913		1923		1924		1925		1926, preliminary	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
PRINCIPAL EXPORTING COUNTRIES	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Argentina	1,977	9	89	4,638	200	579	50	1,416	55	12,584
Australia	923	6,294	[1] 1,025	[1] 3,367	[1] 2,574	[1] 2,248	[1] 1,397	[1] 3,249	[1] 1,220	[1] 3,720
Brazil	3,767	278	183	44,693	182	7,104	9,746	312	1,281	594
Canada	29,189	47,694	54,602	108,273	28,365	139,205	18,821	156,717	18,712	115,821
Chile	3,195	9	264	282	156	1,482	511	259		
China		7,679		8,515	357	10,110	378	16,717	307	14,492
Denmark	7,124	298,086	4,758	420,353	4,095	475,551	2,826	462,925	2,540	460,191
Hungary			12,398	140	7,504	2,663	254	32,485	63	54,685
Irish Free State					58,318	104,690	63,316	78,280	59,676	78,224
Netherlands	88,143	139,916	33,230	133,061	24,718	228,747	13,980	259,464	23,811	204,391
New Zealand	248	1,049	3	4,562	46	3,438	139	5,784	17	8,659
Poland			124	39	41,881	14,578	26,339	57,735	17,385	39,864
Sweden	6,736	19,445	19,712	33,588	14,691	41,797	15,395	17,041	11,498	31,610
United States	171	1,019,561	1,101	1,995,920	5,683	1,681,654	7,235	1,241,209	9,156	1,130,323
PRINCIPAL IMPORTING COUNTRIES										
Austria	[2] 14,338	[2] 3,343	102,106	618	74,890	1,780	47,504	575	21,152	1,200
Belgium	22,232	16,254	44,331	12,126	28,108	10,044	21,376	3,096	15,630	11,336
Cuba	85,973		143,833		167,824		137,214		131,104	
Czechoslovakia			140,229	562	133,422	2,382	84,353	4,277	88,871	3,977
Finland	(3)	(3)	15,724	275	15,794	361	9,312	895	14,334	373
France	59,824	24,668	146,781	5,511	161,278	4,740	57,277	3,334	60,792	3,620
Germany	265,669	3,532	419,087	1,412	438,416	1,189	412,163	2,819	385,273	4,071
Italy	74,861	(3)	23,333	3,230	38,476	1,513	13,360	1,502	5,444	8,661
Norway	9,751	26	25,507	20	17,268	17	13,619	6	8,256	9
Peru	(3)	(3)	9,391	18	15,432		12,848		14,742	(4)
Philippine Islands	4,414		6,207		6,498		5,823		6,174	
Spain	553	641	3,877	797	6,552	1,302	975	1,790	474	2,972
Switzerland	21,976	105	15,922	40	13,170	69	6,550	819	6,594	34
Union of South Africa	8,249	30	1,417	184	1,944	140	1,567	96	1,076	1,514
United Kingdom	875,929	15,820	1,435,996	5,928	1,420,893	6,193	1,373,856	6,162	1,297,155	5,381
Total, 30 countries	1,585,242	1,604,439	2,661,230	2,788,152	2,728,735	2,743,576	2,358,184	2,358,964	2,202,792	2,198,306

Bureau of Agricultural Economics. Official sources.

[1] Year ending June 30. [2] Average for Austria-Hungary. [3] Not separately stated. [4] Less than 500.

TABLE 372.—*Pork: Wholesale and retail price per pound of certain products, 1913–1927*

Year	Hams		Bacon		Fresh pork		Lard	
	Wholesale, smoked, Chicago	Retail,[1] average leading cities	Wholesale, short clear sides, Chicago	Retail, average leading cities	Wholesale loins, Chicago	Retail, chops, average leading cities	Wholesale, prime contract, New York	Retail, average leading cities
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1913	16.6	26.9	12.7	27.0	14.9	21.0	11.0	15.8
1914	16.7	27.3	13.2	27.5	15.4	22.0	10.4	15.6
1915	15.3	26.1	11.6	26.9	14.3	20.3	9.4	14.8
1916	18.5	29.4	14.9	28.7	16.2	22.7	13.5	17.5
1917	25.2	38.2	24.8	41.0	24.4	31.9	21.7	27.6
1918	31.8	47.9	27.9	52.9	29.5	39.0	25.5	33.3
1919	34.3	53.4	29.1	55.4	31.5	42.3	29.0	36.9
1920	33.4	55.5	20.7	52.3	30.7	42.3	20.0	29.5
1921	26.8	48.8	13.5	42.7	22.5	34.9	11.1	18.0
1922	26.5	48.8	14.1	39.8	21.7	33.0	11.5	17.0
1923	21.2	45.5	12.0	39.1	18.0	30.4	12.3	17.7
1924	20.2	45.3	14.4	37.7	19.1	30.8	13.3	19.0
1925	27.1	52.6	22.3	46.7	25.0	36.6	16.8	23.3
1926	30.8	57.4	20.1	50.3	27.8	39.5	15.0	21 9
1927	24.6	55.0	18.7	47.2	(2)	36.8	12.9	19.3

Bureau of Agricultural Economics. Compiled from Bureau of Labor Statistics Wholesale and Retail Price Bulletins.

[1] Mostly on sliced ham. [2] Not reported since July, 1927.

TABLE 373.—*Lard, refined: Average price per 100 pounds, Chicago, by months, 1905–1927*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Av.
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1905	6.73	6.74	6.92	7.12	7.18	7.20	7.09	7.70	7.51	7.12	7.08	7.51	7.16
1906	7.44	7.55	8.03	8.59	8.49	8.74	8.93	8.66	7.79	9.33	9.36	8.75	8.47
1907	9.29	9.70	9.03	8.68	8.95	8.69	8.91	8.89	8.98	8.86	8.16	7.98	8.84
1908	7.70	7.21	7.67	8.19	8.42	8.66	9.30	9.33	9.94	9.62	9.31	9.23	8.72
1909	9.57	9.52	10.05	10.32	10.60	11.54	11.52	11.66	12.23	12.17	12.93	13.12	11.27
1910	12.43	12.50	14.08	12.33	12 95	12.27	11.85	11.82	12 44	12.93	10 82	10.31	12.23
1911	10.32	9.50	8.83	7.93	8.03	8.17	8.30	8.97	9.32	8.85	9.07	9.00	8 86
1912	9.24	8.90	9.37	10.06	10.77	10.87	10.57	10.73	11.08	11.47	11.15	10.46	10.39
1913	9.88	10.50	10.66	11.00	11.05	10.99	11.53	11.28	11.15	10.60	10 63	10.68	10.83
1914	10.89	10.67	10.52	10.23	9.95	10.03	10.08	9.69	9.68	10.22	10.89	10 65	10.24
1915	10.69	10.53	9.84	9.95	9.71	9.39	8.05	7.92	8.13	9.07	8 94	9.47	9.31
1916	10.32	9.99	10.79	11.77	12.80	12.87	13.12	13.44	14 47	15.34	16.91	16.66	13.21
1917	15.66	17.00	19.30	21.00	22.30	21.41	20.77	22.40	24 03	24.29	27.13	25.46	21.73
1918	24.39	26.05	26.07	25.44	24.53	24.50	26.09	26.78	26.98	26.66	26 69	25.31	25.79
1919	23.46	24.83	27.35	30.09	33.58	34.15	34 76	30.01	26.19	27.41	25.86	23.11	28 40
1920	23.52	23.14	22.93	22.71	22.75	22 98	21.71	21.16	22.58	23.28	22.07	18.15	22.25
1921	16.03	14.91	14.48	13.07	11.88	12.03	13.94	13.65	13 51	12.16	11.62	11.25	13.21
1922	11.19	12.59	13.50	12.62	13.15	13.22	13.06	13.30	13.00	14.12	13.78	13.31	13.07
1923	13.20	13.25	13.87	13.42	13.12	13.18	12.84	12.83	15.06	15.22	15.72	15.04	13.90
1924	14.52	13.03	12.84	12.50	12.19	12.13	13.65	15.94	16.25	18.05	16.68	18.00	14.65
1925	17.59	17.03	18.25	17.07	16.50	18.13	18.42	18.94	18.95	18.75	18.50	16.67	17.90
1926	16.81	16.44	16.70	16.75	17.13	18.48	18.00	17.38	17.50	16.75	15.75	15.25	16.91
1927	13.59	13.72	14.38	14.32	14.12	13.35	12.25	12.54	14.25	14.50	13.60	13.25	13.66

Bureau of Agricultural Economics. Prior to February, 1920, figures compiled from the National Provisioner; subsequent figures compiled from data of the livestock and meat reporting service of the bureau.

TABLE 374.—*Lard, American prime western steam: Average price per pound in Liverpool, 1909–1927*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Av.
Average:	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1909–1913	11.5	11.6	11.8	11.7	11.8	11.9	11.9	12.1	12.5	12.5	12.5	12.1	12.0
1921–1925	16.2	16.0	14.9	14.0	13.6	14.0	14.5	14.9	15.0	15.2	15.5	15.0	14.9
1909	10.7	10.6	11.2	11.4	11.8	12.7	12.8	12.8	13.4	13.6	14.7	14.9	12.6
1910	14.1	14.0	15.5	14.8	14.5	13.7	13.3	13.1	13.6	13.8	12.7	11.5	13.7
1911	11.5	11.4	10.0	9.1	9.2	9.1	9.1	9.9	10.4	9.9	10.2	10.1	10.0
1912	10.2	10.0	10.2	10.9	11.4	11.6	11.4	11.8	12.4	13.0	12.6	11.9	11.4
1913	11.2	11.8	12.2	12.4	12.3	12.2	12.7	12.7	12.6	12.1	12.2	12.1	12.2
1914	12.3	11.8	11.5	11.3	10.8	10.9	11.0	12.6	11.4	11.3	12.2	11.7	11.6
1915	12.0	11.6	11.1	11.2	11.1	10.6	9.3	8.3	8.9	10.2	10.8	11.7	10.6
1916	12.7	12.4	13.8	15.4	16.5	15.7	15.4	15.7	17.3	18.3	20.3	20.1	16.1
1917	20.4	[1] 24.8	29.3	27.7	26.3	23.8	23.8	25.0	[2] 25.9	[1] 27.1	28.2	28.6	25.9
1918	28.6	------	------	------	31.7	31.7	------	------	33.2	33.0	------	------	------
1919	------	------	------	------	------	38.1	37.1	36.3	36.5	36.8	35.6	32.9	------
1920	32.0	29.5	32.9	27.2	------	27.4	26.7	------	------	------	23.8	24.2	------
1921	23.4	[2] 23.3	15.7	13.2	11.7	12.1	13.6	13.4	13.2	12.2	12.6	11.7	14.7
1922	11.3	12.9	13.1	12.8	13.6	13.5	13.2	13.3	12.7	13.2	14.1	13.6	13.1
1923	13.3	13.0	13.7	13.6	12.9	13.0	12.7	12.7	14.0	14.5	15.7	15.1	13.7
1924	14.8	13.1	13.2	12.7	12.3	12.2	13.7	15.8	15.8	18.1	17.2	18.1	14.8
1925	18.0	17.5	18.7	17.8	17.6	19.1	19.3	19.2	19.2	17.9	17.8	16.6	18.2
1926	17.2	16.5	16.5	16.0	17.6	18.4	17.8	17.0	16.6	15.8	14.2	14.3	16.5
1927	14.3	14.4	14.4	14.3	14.1	14.4	14.3	13.8	14.6	14.4	14.0	13.5	14.2

Bureau of Agricultural Economics. Compiled from Manchester Guardian. An average of Friday quotations. Converted to cents per pound on the basis of the monthly average rate of exchange as given in Federal Reserve Bulletins.

[1] Interpolated. [2] Government control of prices began Sept. 3, 1917, and ended on Feb. 28, 1921.

TABLE 375.—*Bacon, Wilshire sides,[1] green, firsts: Average price per pound at Bristol, England, 1909–1927*

Year and month	American	Canadian	Danish	Irish	British	Year and month	American	Canadian	Danish	Irish	British
Average:	*Cents*	*Cents*	*Cents*	*Cents*	*Cents.*	1926	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1909–1913	14.2	14.8	15.6	16.1	17.0	January	24.1	26.5	29.4	31.3	32.6
1914–1920	27.1	-------	-------	-------	30.1	February	22.7	26.0	28.0	31.3	32.6
1921–1925	20.0	23.3	27.0	29.1	30.0	March	22.2	25.8	27.7	31.5	33.1
						April	22.2	26.7	29.8	32.2	33.5
1909	13.6	14.3	15.0	15.9	16.7	May	24.1	-------	31.1	32.6	33.9
1910	15.2	15.6	15.9	16.6	17.8	June	25.6	26.3	28.6	33.0	33.5
1911	12.8	13.1	14.3	14.8	15.8	July	25.2	25.6	28.7	32.4	33.5
1912	13.8	14.5	15.9	15.8	16.3	August	25.0	26.6	29.3	31.1	33.5
1913	15.8	16.3	17.1	17.4	18.4	September	23.2	24.8	27.2	29.6	32.9
1914	15.5	15.7	16.4	17.6	18.2	October	22.0	22.4	25.8	28.5	31.5
1915	17.0	18.4	20.4	20.8	21.4	November	22.4	22.3	24.6	27.7	29.1
1916	19.8	22.0	24.0	24.7	26.0	December	-------	21.2	24.0	27.7	28.1
1917	30.1	-------	-------	33.0	33.6						
1918	38.5	-------	-------	-------	30.3	1927					
1919	37.1	37.9	-------	38.4	38.4	January	-------	[2] 20.9	21.5	27.8	28.7
1920	31.6	33.1	34.2	41.7	42.8	February	18.6	-------	21.1	27.9	29.3
1921	21.8	26.5	32.8	34.7	36.2	March	19.0	-------	21.9	28.2	30.2
1922	21.2	25.2	29.7	32.5	33.3	April	18.7	-------	21.9	28.2	29.6
1923	17.5	20.9	23.6	25.8	27.0	May	-------	-------	22.8	28.7	29.6
1924	16.6	19.2	21.3	22.8	23.5	June	-------	20.9	22.6	27.2	27.6
1925	23.0	24.7	27.5	29.7	30.0	July	-------	18.9	21.1	23.5	25.5
1926	-------	-------	27.8	30.7	32.3	August	-------	18.0	21.0	23.6	25.0
1927	-------	-------	21.1	25.5	26.9	September	-------	-------	23.4	26.2	27.4
						October	-------	-------	20.6	21.9	23.9
						November	16.6	-------	17.5	21.0	22.1
						December	16.2	-------	18.3	21.6	23.9

Bureau of Agricultural Economics. Compiled from Agricultural Market Report, Ministry of Agriculture and Fisheries, Great Britain. Average for the last week of each month 1909–1923. Average of weekly averages 1924–1927. Converted to cents per pound on the basis of the monthly average rate of exchange as given in Federal Reserve Bulletins, 1909–1925: at par 1926–1927.

[1] Entire half of hog in one piece, head off, backbone out, ribs in. [2] January 5 quotation only.

TABLE 376.—*Pork carcass: Average price per pound in Great Britain, 1909–1927*

FIRST QUALITY FRESH BRITISH PORK

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Av.
Average:	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1909–1913	14.2	14.2	14.2	14.1	13.8	13.9	13.5	13.7	14.3	14.9	14.9	15.1	14.2
1914–1920	23.8	24.6	25.3	26.9	25.7	25.5	25.6	24.9	26.1	26.9	27.0	26.9	25.8
1921–1925	25.6	24.6	24.5	25.1	25.0	21.9	20.4	21.6	23.5	24.0	24.3	25.0	23.6
1909	12.8	12.8	12.9	13.0	12.7	12.9	13.2	13.2	13.5	14.2	14.8	15.2	13.5
1910	15.1	15.0	15.0	14.8	14.7	14.1	13.9	14.6	15.0	15.4	15.3	14.9	14.8
1911	14.5	14.2	14.2	14.0	13.2	14.6	12.2	12.2	12.7	13.2	12.8	12.5	13.2
1912	12.7	12.7	12.8	12.8	12.5	12.6	12.8	13.0	14.4	15.1	15.1	15.7	13.5
1913	16.1	16.3	16.3	16.1	15.8	15.5	15.5	15.6	16.0	16.4	16.7	17.1	16.1
1914	16.8	16.2	16.2	15.8	14.5	13.9	13.3	14.5	15.1	16.5	16.4	16.3	15.5
1915	15.8	15.9	16.4	17.2	17.0	16.8	16.7	16.9	18.8	20.0	21.4	21.4	17.9
1916	20.1	21.6	21.6	23.6	21.9	21.7	21.7	21.7	23.8	25.4	25.0	26.1	22.8
1917	26.9	27.2	27.7	28.2	26.4	27.2	28.6	25.5	29.1	28.2	28.2	28.2	27.6
1918	28.2	28.2	28.2	31.8	31.8	31.7	31.7	31.8	31.8	34.2	35.7	35.7	31.7
1919	32.1	31.8	31.2	31.0	31.1	30.8	29.5	28.5	27.9	27.8	27.2	26.3	29.6
1920	26.8	[1]31.0	[1]36.0	41.0	37.2	36.1	37.6	35.4	36.3	36.4	34.9	34.2	35.2
1921	32.5	29.7	29.7	30.5	29.0	24.9	22.9	23.5	24.5	22.8	22.5	23.2	26.3
1922	22.5	23.9	24.4	25.3	25.0	23.0	23.9	24.7	26.6	27.3	28.5	30.3	24.5
1923	29.6	28.0	27.0	26.8	30.7	24.5	20.7	20.4	22.4	23.0	22.3	21.5	24.7
1924	20.4	19.2	18.5	19.2	18.1	16.6	14.1	18.1	19.0	20.2	20.5	21.0	18.7
1925	23.0	22.0	22.9	23.6	22.3	20.4	20.6	21.4	24.8	26.5	27.3	28.9	23.6
1926	28.3	27.9	28.0	27.1	27.6	26.0	26.4	26.6	28.8	30.3	29.8	29.3	28.0
1927	28.5	27.8	27.6	27.5	24.3	23.2	21.5	21.2	22.7	22.5	21.3	22.2	24.2

[1]Bureau of Agricultural Economics. Compiled from Agricultural Statistics 1909-1922, and Agricultural Market Report, 1923–1926 Ministry of Agriculture and Fisheries, Great Britain, Converted to cents per pound on the basis of the monthly average rate of exchange as given in Federal Reserve Bulletins.

TABLE 377.—*Hogs: Cholera-control work by Bureau of Animal Industry, 1919–1927*

Year ended June 30, and State	Bureau veterinarians engaged in work [1]	Premises investigated	Demonstrations		Autopsies performed	Farms quarantined or carded	Farms cleaned and disinfected	Outbreaks reported to bureau veterinarians
			Number	Hogs treated				
1919	180	93,512	----------	233,987	53,586	9,564	4,382	12,336
1920	140	46,125	3,037	347,702	10,963	6,129	2,099	9,788
1921	54	29,433	3,420	67,295	3,888	2,268	656	7,951
1922	80	47,137	4,343	88,846	5,390	1,401	439	7,920
1923	71	52,348	5,234	108,562	5,247	1,772	741	7,204
1924	45	29,443	3,178	78,007	3,686	1,634	847	7,225
1925	34	24,060	2,353	51,331	2,383	886	470	3,437
1926	35	20,599	2,579	69,230	2,446	854	347	4,558
1927								
Alabama	1.5	1,768	1,201	22,931	175	----------	----------	431
Arkansas	1.4	677	170	2,651	29	----------	----------	1,323
California	1	315	47	1,557	162	----------	----------	35
Colorado	.1	25	3	311	35	----------	----------	15
Florida	2.5	948	1,151	35,948	161	----------	----------	339
Georgia	1.3	1,108	359	4,114	49	----------	----------	155
Idaho	1	542	8	309	36	17	26	42
Illinois	2	1,960	25	1,081	572	386	574	933
Indiana	2	1,203	5	196	275	46	1	842
Iowa	2	722	3	257	243	----------	----------	1,200
Kansas	.1	25	4	101	13	----------	----------	68
Kentucky	1.5	2,765	96	2,332	203	----------	1	221
Louisiana	1	224	107	2,458	23	----------	----------	88
Maryland	2	2,848	27	239	278	509	2	668
Michigan	1	751	36	1,181	153	----------	----------	410
Mississippi	.86	808	48	890	29	----------	1	119
Missouri	1	744	11	381	116	----------	2	227
Montana	.02	7	----------	----------	10	26	3	31
Nebraska	1	377	----------	----------	248	----------	----------	130
North Carolina	.8	309	58	2,661	99	----------	----------	56
North Dakota	.83	171	157	1,703	78	503	128	557
Ohio	1	1,195	13	904	91	----------	----------	1,795
Oklahoma	2	1,534	40	1,371	75	148	1	182
South Carolina	1	546	493	6,386	38	----------	----------	42
South Dakota	1	272	11	439	63	----------	----------	96
Tennessee	1	291	31	1,052	74	47	1	694
Texas	2	970	15	610	46	43	2	238
Utah	.05	13	----------	----------	9	3	----------	3
Virginia	1	699	622	1,895	157	1	----------	214
Washington	1	456	20	534	51	19	2	46
Oregon	.05	71	----------	----------	1	2	----------	4
West Virginia	.2	136	5	50	12	8	----------	211
Wisconsin	1.75	524	97	3,375	137	74	----------	140
Total	36.96	25,004	4,863	97,917	3,741	1,832	744	11,555

Bureau of Animal Industry.

[1] Fractions denote veterinarians devoting a part of their time to the work.

TABLE 378.—*Sheep: Number and price to producers in the United States, 1840, 1850, 1860, 1867–1928*

Year	Sheep [1] on farms	Price per head to producer Jan. 1	Sheep on farms and elsewhere [2]	Year	Sheep [1] on farms	Price per head to producer Jan. 1	Sheep on farms and elsewhere [2]
	Thousands	*Dollars*	*Thousands*		*Thousands*	*Dollars*	*Thousands*
1840, June 1 [3]	*19,311*			1898	37,657	2.46	42,600
1850, June 1 [3]	*21,723*			1899	39,114	2.75	44,600
1860, June 1 [3]	*22,471*			1900	[4] 41,883	3.03	48,100
1867	39,385	2.50	38,100	1900, June 1	*61,504*		
1868	38,992	1.82	37,600	1900	44,573		
1869	37,724	1.64	36,200	1901	46,155	2.98	50,400
1870, June 1 [3]	*28,478*			1902	46,667	2.65	51,900
1870	40,853	1.90	39,000	1903	45,180	2.63	53,000
1871	31,851	2.14	38,900	1904	42,439	2.59	42,500
1872	31,679	2.61	38,600	1905	40,268	2.82	36,800
1873	33,002	2.71	40,100	1906	42,454	3.54	41,000
1874	33,938	2.43	41,100	1907	44,518	3.84	42,700
1875	33,784	2.55	40,800	1908	46,557	3.88	43,500
1876	35,935	2.37	43,300	1909	48,382	3.43	44,300
1877	35,804	2.13	43,000	1910, Apr. 15	*52,448*		
1878	35,740	2.21	42,800	1910	47,072	4.12	44,800
1879	38,124	2.07	45,500	1911	47,349	3.91	45,700
1880, June 1 [3]	*35,192*			1912	43,279	3.46	44,600
1880	40,766	2.29	48,500	1913	40,700	3.94	43,700
1881	43,570	2.39	51,200	1914	37,773	4.02	42,200
1882	45,016	2.37	52,300	1915	36,287	4.50	42,200
1883	49,237	2.53	56,600	1916	36,543	5.17	41,100
1884	50,627	2.37	57,500	1917	36,700	7.13	40,200
1885	50,360	2.14	56,500	1918	39,000	11.82	40,900
1886	48,322	1.91	53,600	1919	41,000	11.63	41,100
1887	44,759	2.01	49,100	1920, Jan. 1	*35,034*		
1888	43,545	2.05	47,200	1920	40,243	10.46	[5] 40,693
1889	42,599	2.13	45,700	1921	38,690	6.28	39,123
1890, June 1 [3]	*35,935*			1922	36,186	4.80	36,591
1890	44,336	2.41	47,000	1923	36,212	7.53	36,617
1891	43,431	2.50	46,400	1924	36,876	7.91	37,288
1892	44,938	2.58	48,400	1925, Jan. 1	*35,590*		
1893	47,274	2.66	51,300	1925	38,112	9.70	38,538
1894	45,048	1.98	49,300	1926	39,730	10.51	40,174
1895	42,294	1.58	46,700	1927	41,846	9.71	42,314
1896	38,299	1.70	42,600	1928	44,545	10.22	45,092
1897	36,819	1.82	41,300				

Data for sheep on farms and price paid to producers (except italic figures from the census) from reports of the Bureau of Agricultural Economics as of Jan. 1.

[1] Figures 1900–1919 are tentative revised estimates of the Bureau of Agricultural Economics not previously published and are subject to change.

[2] Data for sheep on farms and elsewhere as of Jan. 1 prior to 1920 estimated by the Bureau of Animal Industry are tentative and subject to revision after more extensive research. Census figures prior to 1920 were adjusted to a Jan. 1 basis and to include all ages and all animals in towns, villages, and ranges, as well as on farms. For methods see Department Circular 241 as published in 1922. Figures from 1920–1928 are the estimates of the Bureau of Agricultural Economics of sheep on farms plus an estimate made by the Bureau of Animal Industry of sheep in towns and villages.

[3] Figures for census years 1860, 1880, and 1890 exclude an estimated number of unenumerated sheep on ranges as follows: 1860, 1,505,810; 1880, 7,000,000; 1890, 4,940,948. Censuses prior to 1900 exclude lambs.

[4] Original estimate of the Bureau of Agricultural Economics.

[5] Census figure adjusted to department total.

TABLE 379.—*Sheep and lambs: Estimated number on farms and value per head, by States, January 1, 1922–1928*

State	Number, Jan. 1—							Value per head, Jan. 1—						
	1922	1923	1924	1925	1926	1927	1928[1]	1922	1923	1924	1925	1926	1927	1928[1]
	Thousands	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
Maine	86	83	84	89	95	92	97	4.80	6.70	7.10	7.60	8.00	8.30	8.40
New Hampshire	20	19	17	18	19	20	20	5.80	8.00	7.40	8.10	8.60	9.00	9.60
Vermont	42	40	43	40	43	43	46	5.10	7.10	7.50	8.30	8.90	9.40	9.30
Massachusetts	15	13	12	12	11	11	12	7.10	7.20	8.20	9.70	9.40	9.80	10.50
Rhode Island	2	2	2	2	2	2	2	6.50	8.00	8.00	10.00	9.50	10.00	10.50
Connecticut	9	8	8	8	8	7	8	7.90	8.10	8.20	9.40	10.20	10.40	10.80
New York	474	446	442	473	497	477	491	5.80	8.50	9.20	10.60	11.60	10.80	11.10
New Jersey	8	7	6	6	6	6	5	7.80	7.70	9.30	9.50	10.80	11.80	12.20
Pennsylvania	468	449	431	415	415	400	437	5.70	7.10	7.70	8.80	9.70	9.40	9.50
Ohio	1,869	1,906	1,925	1,941	2,000	2,133	2,244	4.60	7.10	7.30	8.90	9.50	8.50	8.90
Indiana	545	563	582	595	647	731	705	5.20	8.00	8.40	10.60	11.50	10.10	11.00
Illinois	525	509	574	556	710	800	698	5.30	7.80	8.20	10.40	11.30	10.00	10.40
Michigan	1,002	1,052	1,052	1,066	1,173	1,314	1,301	5.20	8.10	8.30	11.20	12.00	10.40	10.90
Wisconsin	366	329	343	360	401	469	430	4.60	7.50	8.10	10.20	11.00	9.60	10.20
Minnesota	467	408	428	462	540	628	678	4.70	7.20	7.90	10.60	11.20	9.70	10.40
Iowa	852	840	900	870	913	1,047	960	5.40	8.40	8.30	11.20	11.80	10.20	10.80
Missouri	976	937	928	894	940	986	986	4.50	7.10	7.60	9.40	10.00	9.70	10.00
North Dakota	203	204	245	311	373	425	454	4.70	7.30	7.80	9.90	11.20	10.10	10.70
South Dakota	674	663	689	682	700	749	824	4.50	7.70	7.80	10.50	10.80	9.90	10.50
Nebraska	600	840	800	780	810	684	995	5.10	8.00	7.90	10.50	10.30	8.70	9.00
Kansas	454	345	314	384	452	475	512	4.80	7.30	7.10	9.10	9.80	9.40	9.30
Delaware	2	2	2	2	2	2	2	6.00	7.50	7.00	10.00	10.00	10.00	12.00
Maryland	95	95	91	92	96	98	101	6.20	7.50	8.50	9.50	10.40	10.30	11.60
Virginia	321	331	338	351	362	380	426	5.60	7.60	8.00	8.90	10.10	10.30	11.50
West Virginia	520	500	475	485	485	500	565	4.80	6.90	7.30	8.20	9.40	10.10	11.10
North Carolina	86	80	70	67	73	80	85	4.90	5.60	6.40	6.20	6.60	7.40	9.00
South Carolina	18	15	14	14	13	14	15	3.10	4.40	4.80	4.40	4.10	4.90	4.90
Georgia	68	63	53	51	51	51	52	2.70	3.00	2.60	3.40	3.20	3.60	3.80
Florida	63	62	61	60	59	59	59	3.10	3.50	2.90	3.30	3.00	3.20	3.60
Kentucky	687	690	700	715	751	871	953	5.00	7.00	7.90	8.90	10.10	10.70	11.20
Tennessee	330	320	304	292	286	300	345	4.00	5.50	5.90	5.90	7.40	10.10	9.60
Alabama	78	73	61	57	48	53	66	2.70	3.40	4.00	4.30	3.90	3.70	4.40
Mississippi	142	128	122	114	108	76	45	3.00	2.70	2.80	2.90	3.00	3.30	3.40
Arkansas	85	74	63	52	49	54	54	3.00	3.00	3.30	3.90	4.80	5.80	6.10
Louisiana	124	122	116	109	105	102	107	2.80	2.90	3.10	3.20	3.00	3.00	3.00
Oklahoma	83	55	63	64	70	84	101	4.40	5.80	5.90	7.30	8.80	9.20	8.70
Texas	3,053	2,931	3,300	3,500	3,535	4,065	4,593	3.60	5.40	6.10	7.50	8.10	7.80	8.50
Montana	2,460	2,370	2,441	2,579	2,880	3,053	3,206	4.70	8.70	8.70	10.40	11.40	10.50	11.00
Idaho	2,016	2,046	1,946	1,960	1,880	1,974	2,073	6.00	8.40	8.90	10.90	11.80	10.80	11.40
Wyoming	2,676	2,520	2,520	2,700	2,870	3,100	3,131	5.40	8.90	9.00	10.80	11.50	10.20	10.70
Colorado	1,940	2,449	2,327	2,565	2,537	1,938	2,746	4.70	7.40	7.40	10.30	10.50	9.40	9.60
New Mexico	2,085	1,877	2,007	2,100	2,050	2,250	2,362	3.90	6.50	6.50	8.50	9.50	8.70	8.90
Arizona	1,245	1,243	1,181	1,164	1,220	1,230	1,267	4.90	6.30	7.00	8.20	8.90	9.10	9.40
Utah	2,335	2,386	2,425	2,355	2,472	2,650	2,730	5.00	9.10	8.80	11.30	12.00	10.80	11.20
Nevada	1,125	1,190	1,060	1,100	1,175	1,198	1,234	5.10	8.70	9.00	11.00	11.70	10.60	11.00
Washington	451	465	497	516	478	526	542	5.30	8.10	8.80	11.20	12.10	11.00	11.50
Oregon	1,966	1,868	1,924	2,039	2,120	2,247	2,247	4.40	6.40	8.40	10.40	11.50	10.40	11.20
California	2,475	2,600	2,890	3,045	3,200	3,392	3,528	5.30	8.10	9.00	9.20	10.60	10.00	11.30
United States	36,186	36,212	36,876	38,112	39,730	41,846	44,545	4.80	7.53	7.91	9.70	10.51	9.71	10.22

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

[1] Preliminary.

TABLE 380.—*Sheep: Number in countries having 100,000 and over, average 1909–1913 and 1921–1925, annual 1924–1927*

Country	Month of estimate	Average, 1909–1913 [1]	Average, 1921–1925 [1]	1924	1925	1926	1927, preliminary
NORTH AND CENTRAL AMERICA AND WEST INDIES		*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
Canada	July	2,208	3,027	2,685	2,756	3,142	3,263
United States	January	51,929	37,215	36,876	38,112	39,730	41,846
Mexico		[2][3] 3,424	1,424	1,728	1,162	2,381	
Guatemala		514	153	248	114	148	98
Dominican Republic		(134)	148				
Total above countries reporting:							
Pre-war to 1926		58,075	41,819	41,537	42,144	45,401	
Pre-war to 1927		54,651	40,395	39,809	40,982	43,020	45,207
Estimated total [4]		58,000	42,000	42,000	43,000		
SOUTH AMERICA							
Colombia		[5] 246	776	771	780	800	
Venezuela		177	113				
Ecuador			500			700	
Peru			11,363				[6] 12,000
Bolivia		1,750				3,436	4,220
Chile		3,477	4,332		4,094		
Brazil	September	10,550	[7] 7,933				
Uruguay		[2][8] 26,286	[2] 14,443	[2] 14,443			
Paraguay	December [9]	[10] 600					
Argentina	do.[9]	[2][11] 43,225	[2][12] 36,209				
Falkland Islands		711	649		631		
Total South American countries reporting:							
Pre-war to 1926		246	776	771	780	800	
Estimated total [4]		93,000	79,000				
EUROPE							
Iceland		589	565	583	566		
England and Wales	June	18,346	14,385	14,843	15,975	16,859	17,070
Scotland	do	7,028	6,827	6,886	7,119	7,203	7,424
Ireland	do	3,787	3,453	3,235	3,297	3,533	3,721
Norway [13]	do	1,398	1,304	1,507	1,529	1,595	1,608
Sweden	do	1,205	1,384		[14] 1,200		
Denmark	July	533	380	302	261	233	
Faroe Islands		112	66	64			
Holland	May–June	842	668				
Belgium	December [9]	189	126				
France	do.[9]	16,176	9,777	9,925	10,172	10,537	10,775
Spain	do.[9]	15,778	19,252	18,550	18,460	20,067	20,529
Portugal		[2][15] 3,073	3,768		3,684		[6] 4,450
Italy	March–April	11,615	12,014	12,000			[6] 12,500
Switzerland	April	161	245			169	
Germany	December [9]	4,988	5,889	[16] 6,105	5,735	4,753	4,080
Austria	do.[9]	301	526				
Czechoslovakia	do.[9]	1,322	[2][7] 986			861	
Hungary	April	2,406	1,661	1,814	1,891	1,804	
Yugoslavia	January	10,496	7,728	7,619	7,907	7,933	
Greece		5,884	5,798				
Bulgaria	December.[9]	8,551	8,186		7,450		8,682
Rumania	do.[9]	11,128	11,660	12,481	13,612	12,950	13,582

[1] Average for 5-year period if available, otherwise for any year or years within this period except as otherwise stated. In countries having changed boundaries the pre-war figures are estimates for 1 year only of numbers within present boundaries.

[2] Census figures.

[3] Year 1902.

[4] These totals include countries with less than 100,000, interpolations for a few countries not reporting each year and rough estimates for some others.

[5] Year 1916.

[6] Unofficial.

[7] Year 1920.

[8] Year 1908.

[9] Countries reporting as of Dec. 31 are considered as of Jan. 1 of the following year—i. e., figures for number of sheep in France as of Dec. 31, 1924, has been placed in 1925 column.

[10] Year 1915.

[11] June, 1914.

[12] December, 1922.

[13] In rural communities only.

[14] Estimate forwarded by Assistant Trade Commissioner Wrenn in his monthly report for January, 1927, based on information furnished by consuls or other commercial representatives in the separate countries.

[15] 1906.

[16] No census was made as of December, 1923, which estimate would have been considered as of January, 1924, in this table as explained in note 8, so the figure for October, 1923, has been used.

TABLE 380.—*Sheep: Number in countries having 100,000 and over, average 1909–1913 and 1921–1925, annual 1924–1927*—Continued

Country	Month of estimate	Average, 1909–1913	Average, 1921–1925	1924	1925	1926	1927, preliminary
EUROPE—continued							
Poland		4,268	2,403	2,500			[6] 4,000
Lithuania		1,152	1,314	1,399	1,455	1,573	
Latvia	June	996	1,240	1,235	1,182	1,153	1,128
Estonia	July	486	654	607	720	666	667
Finland	September	1,330	1,544	1,485	1,451	1,413	
Russia [17]	Summer	[5] 62,970	49,597	56,191	70,309	73,301	[18] 76,268
Total European countries reporting:							
Pre-war to 1926		158,998	136,665	144,184	161,075	165,573	
Pre-war to 1927		143,081	124,038	131,565	148,110	152,617	156,852
Estimated total [4]		197,000	173,000				
AFRICA							
Morocco		3,175	7,533	8,215	9,278		
Algeria	September	8,757	5,944	5,790	6,171	6,786	
Libia (Italian)		996					
Tunis	December [9]	705	1,794	1,451	1,379	1,329	1,461
French West Africa			3,742				
French Sudan			2,173				
Gold Coast		250	373	420	320		
Nigeria			1,681	1,487	1,479	1,809	
Egypt	September	816	1,013	1,085	1,091	1,144	
Anglo-Egyptian Sudan			1,638	1,638	1,639	2,000	
Italian Somaliland			1,666				
Eritrea (Italian) [17]		1,585	1,701				
Kenya Colony		5,469	2,600	2,568	2,679	2,756	
French Cameroon		(200)	287	275	325	410	
Uganda		612	386	531	604	866	
Belgian Congo		300	304	310	310	300	
British Southwest Africa		555	954	905	966	1,069	
Bechuanaland		358	125	121	129	132	
Union of South Africa	April–August	30,657	32,522	32,198	35,570		39,551
Basutoland		1,369	1,954	2,002	2,051	2,100	
Rhodesia, Southern		300	333	325	340	349	332
Swaziland		164	62	77			
Tanganyika Territory		2,793	3,672		4,333	4,462	
Madagascar		318	110		110	116	
Total African countries reporting:							
Pre-war to 1926		19,441	15,694	15,363	16,045	17,241	
Pre-war to 1927		1,005	2,127	1,776	1,719	1,678	1,793
Estimated total [4]		72,000	76,000				
ASIA							
Cyprus	March	279	257	240	244	207	
Turkey, European and Asiatic		19,713	11,237	10,357	11,439	11,702	
Iraq (Mesopotamia) [17]			5,270	5,648	4,892	5,055	
Palestine			271	298	291	291	243
Persia			4,000		4,000		
Syria			1,797	1,841	1,290	1,400	
India, British	December–April	23,164	22,412	22,340	23,226	23,201	
Native States		8,038	12,273	12,262	13,591		
Russia [17]		[5] 27,791	[19] 19,142	22,656	[20] 25,029	[20] 25,840	[20] 28,811
China		25,951					
Philippines	December [9]	96	260	302	319	345	
Dutch East Indies:							
Java and Madura			915				
Outer Possessions			115				
Total Asiatic countries reporting:							
Pre-war to 1926		71,043	53,308	55,895	60,257	61,295	
Pre-war to 1927		27,791	19,142	22,656	25,029	25,840	28,811
Estimated total [4]		127,000	114,000				

[4] These totals include countries with less than 100,000, interpolations for a few countries not reporting each year and rough estimates for some others.
[5] Year 1916.
[6] Unofficial.
[9] Countries reporting as of Dec. 31 are considered as of Jan. 1 of the following year—i. e., figures for number of sheep in France as of Dec. 31, 1924, has been placed in 1925 column.
[17] Goats included.
[18] No estimate for Crimea, so have used the 1926 estimate for that territory. Exclusive of Crimea, the number is 75,625,000.
[19] Includes estimated number in Turkestan and Azerbaijan (part of Transcaucasia) according to census of 1920 and the estimated number in Turkestan, Transcaucasia, and Kazak-Kirghiz in 1924.
[20] Includes 13,401,300 sheep in Turkestan, Kazak-Kirghiz, and Transcaucasia in 1924. The number in Siberia and the Far East only was as follows: 1925, 11,627,500; 1926, 12,439,000; 1927, 13,410,000.

TABLE 380.—*Sheep: Number in countries having 100,000 and over, average 1909–1913 and 1921–1925, annual 1924–1927*—Continued

Country	Month of estimate	Average, 1900–1913	Average, 1921–1925	1924	1925	1926	1927, preliminary
OCEANIA							
Australia	December [9]	89,008	[21] 85,556	[21] 84,011	[21] 93,155	[21] 103,563	[22] 103,000
New Zealand	April	23,996	23,382	23,776	24,548	24,905	25,649
Total Oceanic countries reporting:		113,004	108,938	107,787	117,703	128,468	--------
Pre-war to 1926		113,004	108,938	107,787	117,703	128,468	128,649
Pre-war to 1927		113,000	109,000	108,000	118,000	128,000	129,000
Estimated total [4]							
Total world countries reporting:							
Pre-war to 1926		420,807	357,200	365,537	398,004	418,778	--------
Pre-war to 1927		339,532	294,640	303,603	330,543	351,623	361,312
Estimated world total [4]		670,000	593,000	--------	--------	--------	--------

Bureau of Agricultural Economics. Official sources and International Institute of Agriculture unless otherwise stated.

[4] These totals include countries with less than 100,000, interpolations for a few countries not reporting each year and rough estimates for some others.
[9] Countries reporting as of Dec. 31 are considered as of Jan. 1 of the following year—i. e., figures for number of sheep in France as of Dec. 31, 1924, has been placed in 1925 column.
[21] Revised estimates. These are on the average about 5 per cent above the unrevised estimates.
[22] Preliminary estimate.

TABLE 381.—*Sheep: Receipts at principal public stockyards and at all public stockyards, 1909–1927*

Year	Chicago	Denver	East St. Louis	Fort Worth	Kansas City	Omaha	South St. Joseph	South St. Paul	Sioux City	Total nine markets [1]	All other stockyards reporting [2]	Total all stock yards reporting [2]
	Thousands	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
1909	4,441	634	776	188	1,645	2,167	621	496	78	11,046	--------	--------
1910	5,229	596	736	163	1,841	2,985	560	865	151	13,126	--------	--------
1911	5,736	617	992	187	2,175	2,978	718	712	212	14,327	--------	--------
1912	6,056	777	1,031	284	2,134	2,951	729	628	207	14,797	--------	--------
1913	5,903	620	950	328	2,095	3,222	812	785	271	14,986	--------	--------
1914	5,378	692	749	408	2,002	3,114	830	795	404	14,372	--------	--------
1915	3,510	765	648	363	1,815	3,268	878	704	337	12,288	6,147	18,435
1916	4,291	1,409	671	431	1,758	3,171	804	623	321	13,479	7,213	20,692
1917	3,595	2,060	531	406	1,499	3,017	679	430	267	12,484	7,732	20,219
1918	4,630	1,652	536	335	1,667	3,386	827	630	387	14,050	8,435	22,485
1919	5,244	2,087	724	453	1,945	3,789	1,007	912	686	16,847	10,409	27,256
1920	4,005	2,079	605	394	1,687	2,891	843	729	358	13,591	9,947	23,538
1921	4,734	1,468	636	357	1,780	2,753	931	633	288	13,580	10,588	24,168
1922	3,874	1,867	628	325	1,574	2,533	730	499	223	12,253	10,111	22,364
1923	4,098	1,857	561	386	1,671	2,970	979	454	216	13,192	8,833	22,025
1924	4,192	2,040	489	373	1,569	2,844	1,089	476	310	13,382	8,819	22,201
1925	3,969	2,357	559	314	1,500	2,420	1,143	545	360	13,167	8,933	22,100
1926	4,405	1,826	636	445	1,762	2,780	1,303	773	449	14,379	9,489	23,868
1927	3,829	1,908	574	445	1,616	2,604	1,348	705	527	13,556	10,383	23,939

Bureau of Agricultural Economics. Prior to 1915 receipts compiled from yearbooks of stockyard companies; subsequent figures compiled from data of the livestock and meat reporting service of the bureau. Receipts, 1900–1908, are available in 1924 Yearbook, p. 935, Table 542.

[1] Total of the rounded detail figures. [2] Figures prior to 1915 not obtainable.

TABLE 382.—*Sheep: Receipts and stocker and feeder shipments at all public stockyards, 1915–1927*

RECEIPTS

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec	Total
	Thousands	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
1915 [1]	1, 517	1, 257	1, 218	1, 019	1, 050	1, 080	1, 264	1, 725	2, 501	2, 359	2, 042	1, 373	18, 435
1916 [1]	1, 450	1, 280	1, 156	1, 144	1, 347	1, 394	1, 451	1, 984	2, 650	3, 231	2, 126	1, 479	20, 692
1917	1, 578	1, 384	1, 256	1, 152	1, 059	1, 240	1, 353	1, 763	2, 554	3, 195	2, 102	1, 583	20, 219
1918	1, 354	1, 096	1, 270	1, 159	1, 214	1, 429	1, 639	2, 270	3, 496	3, 327	2, 605	1, 626	22, 485
1919	1, 594	1, 157	1, 268	1, 438	1, 468	1, 775	2, 287	3, 360	3, 854	3, 754	2, 845	2, 456	27, 256
1920	1, 614	1, 416	1, 315	1, 466	1, 488	1, 640	2, 034	2, 606	2, 895	3, 027	2, 471	1, 566	23, 538
1921	1, 792	1, 516	1, 750	1, 677	1, 916	1, 849	1, 776	2, 500	2, 618	3, 042	2, 068	1, 664	24, 168
1922	1, 835	1, 399	1, 465	1, 227	1, 692	1, 700	1, 677	1, 951	2, 303	3, 311	2, 288	1, 516	22, 364
1923	1, 636	1, 366	1, 430	1, 447	1, 794	1, 426	1, 661	1, 800	2, 659	3, 464	1, 816	1, 526	22, 025
1924	1, 697	1, 412	1, 367	1, 348	1, 344	1, 550	1, 672	2, 005	3, 027	3, 295	1, 879	1, 605	22, 201
1925	1, 467	1, 388	1, 504	1, 541	1, 689	1, 603	1, 699	2, 064	2, 627	3, 198	1, 712	1, 608	22, 100
1926	1, 548	1, 486	1, 694	1, 502	1, 717	1, 913	1, 739	2, 277	3, 279	3, 090	1, 917	1, 706	23, 868
1927	1, 740	1, 501	1, 558	1, 486	2, 013	1, 816	1, 676	2, 209	2, 848	3, 587	1, 896	1, 609	23, 939

STOCKER AND FEEDER SHIPMENTS

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec	Total
1916 [1]	73	77	62	58	67	83	100	340	661	1, 065	546	145	3, 277
1917	126	107	68	102	76	146	195	368	968	1, 195	791	306	4, 448
1918	128	122	124	221	161	242	212	525	1, 105	1, 245	763	360	5, 208
1919	229	131	136	207	160	223	340	1, 039	1, 505	1, 386	860	740	6, 956
1920	311	140	135	269	234	227	325	568	796	1, 059	857	259	5, 180
1921	88	62	84	107	123	89	139	404	555	731	511	202	3, 095
1922	183	169	143	97	145	191	204	350	534	1, 138	757	256	4, 167
1923	171	169	114	82	216	117	188	341	897	1, 489	540	154	4, 478
1924	149	106	83	105	118	152	226	444	973	1, 438	676	206	4, 676
1925	138	119	94	109	178	137	193	421	857	1, 392	475	219	4, 332
1926	155	107	83	124	130	238	260	567	1, 093	1, 150	493	223	4, 623
1927	207	136	140	118	259	258	216	390	947	1, 560	497	174	4, 902

Bureau of Agricultural Economics. Compiled from data of the livestock and meat reporting service of bureau.

[1] Complete information for 1915 and 1916, particularly on disposition of stock, is not obtainable.

TABLE 383.—*Sheep: Receipts, local slaughter, and stocker and feeder shipments at public stockyards, 1924–1927*

Market	Receipts				Local slaughter				Stocker and feeder shipments			
	1924	1925	1926	1927	1924	1925	1926	1927	1924	1925	1926	1927
	Thousands	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
Albany, N. Y.	------	------	------	(1)	------	------	------	0	------	------	------	0
Amarillo, Tex.	159	148	95	157	0	0	0	0	127	96	42	138
Atlanta, Ga.	3	6	2	6	2	1	1	2	0	0	0	0
Augusta, Ga.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	0	0	0
Baltimore, Md.	288	307	292	360	126	104	105	112	1	(1)	2	1
Boston, Mass.	2	3	3	3	0	0	0	0	0	0	0	0
Buffalo, N. Y.	1,166	1,059	1,111	1,234	138	129	133	160	9	9	15	9
Chattanooga, Tenn.	1	2	1	2	1	2	1	1	0	0	(1)	(1)
Cheyenne, Wyo.	157	105	110	113	0	0	0	0	0	0	0	0
Chicago, Ill.	4,192	3,969	4,405	3,829	2,812	2,860	2,962	2,791	707	597	791	503
Cincinnati, Ohio	327	370	329	319	60	53	57	60	11	18	22	17
Cleveland, Ohio	365	416	393	449	181	188	191	206	3	0	0	3
Dallas, Tex.	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	0	0	0	0
Dayton, Ohio	8	8	8	8	6	5	5	6	0	0	0	0
Denver, Colo.	2,040	2,357	1,826	1,908	168	167	192	189	1,130	1,115	787	1,156
Detroit, Mich.	393	367	393	484	212	200	233	293	10	10	14	19
East St. Louis, Ill.	489	559	636	574	311	338	371	369	46	12	6	6
El Paso, Tex.	41	124	83	123	9	6	10	10	15	78	28	71
Evansville, Ind.	6	7	10	19	2	1	2	15	(1)	(1)	1	1
Fort Wayne, Ind.	18	20	22	24	2	1	2	1	1	3	3	11
Fort Worth, Tex.	373	314	445	445	155	141	205	224	50	60	77	47
Fostoria, Ohio	15	14	12	14	(1)	(1)	(1)	(1)	1	(1)	0	0
Indianapolis, Ind.	123	147	221	216	56	58	66	68	9	17	19	22
Jacksonville, Fla.	(1)	(1)	3	2	(1)	(1)	(1)	(1)	0	0	2	2
Jersey City, N. J.	1,230	1,213	1,269	1,254	1,230	1,213	1,269	1,245	0	0	0	0
Kansas City, Mo.	1,569	1,500	1,762	1,616	1,046	1,046	1,202	1,125	368	319	359	354
Knoxville, Tenn.	2	3	(1)	1	(1)	(1)	(1)	1	0	0	0	(1)
La Fayette, Ind.	6	6	4	8	1	2	1	2	1	2	2	1
Lancaster, Pa.	15	18	34	20	3	3	4	4	0	0	0	0
Laredo, Tex.	3	3	3	11	3	3	2	6	1	(1)	(1)	(1)
Los Angeles, Calif.	102	30	46	34	102	28	47	32	(1)	1	(1)	0
Louisville, Ky.	213	229	231	219	18	22	26	29	18	26	61	48
Marion, Ohio	12	8	16	6	(1)	(1)	(1)	(1)	1	(1)	1	1
Memphis, Tenn.	1	4	3	4	(1)	1	1	1	(1)	(1)	(1)	2
Milwaukee, Wis.	37	45	51	50	33	34	40	42	0	0	2	1
Montgomery, Ala.	2	3	11	8	1	(1)	(1)	1	(1)	(1)	2	1
Moultrie, Ga.	(1)	(1)	0	0	0	0	0	0	0	0	0	0
Muncie, Ind.	0	11	17	16	0	(1)	(1)	(1)	0	1	3	3
Nashville, Tenn.	116	145	165	155	20	20	20	23	1	2	2	6
Newark, N. J.	33	38	39	41	33	38	39	41	(1)	0	0	0
New Orleans, La.	2	2	2	4	2	1	1	1	(1)	1	1	3
New York, N. Y.	68	109	149	270	68	109	149	270	0	0	0	0
North Salt Lake, Utah	618	688	600	616	45	44	49	18	345	378	320	346
Ogden, Utah	565	884	1,034	1,177	9	4	5	4	244	306	371	344
Oklahoma City, Okla.	9	10	14	19	6	6	7	9	2	2	2	6
Omaha, Nebr.	2,844	2,420	2,780	2,604	1,602	1,522	1,643	1,489	823	593	910	895
Pasco, Wash.	84	71	59	70	0	0	0	0	0	0	0	6
Peoria, Ill.	3	6	17	10	1	1	1	1	2	4	13	3
Philadelphia, Pa.	251	227	220	241	246	223	213	238	0	0	0	0
Pittsburgh, Pa.	979	910	1,073	1,003	115	105	114	120	0	0	0	0
Portland, Oreg.	199	179	182	150	96	94	97	80	8	6	6	9
Pueblo, Colo.	875	713	810	903	0	0	0	0	347	299	232	344
Richmond, Va.	9	8	10	10	7	6	6	7	2	1	2	2
South St. Joseph, Mo.	1,089	1,143	1,303	1,348	805	866	1,010	1,045	229	203	231	243
South St. Paul, Minn.	476	545	773	705	314	347	411	448	63	63	130	89
South San Francisco, Calif.	------	------	------	180	------	------	------	141	------	------	------	1
San Antonio, Tex.	18	11	14	37	3	3	4	5	7	4	7	16
Seattle, Wash.	100	78	88	75	99	75	86	73	0	0	0	0
Sioux City, Iowa	310	360	449	527	193	274	336	375	63	61	84	106
Sioux Falls, S. Dak.	5	2	8	9	(1)	(1)	(1)	1	(1)	(1)	1	1
Spokane, Wash.	48	37	57	40	13	10	9	8	12	16	22	22
Springfield, Ill.	------	------	------	2	------	------	------	1	------	------	------	(1)
Springfield, Mo.	------	------	------	8	------	------	------	(1)	------	------	------	1
Springfield, Ohio	14	16	26	31	1	(1)	1	1	0	0	5	0
Toledo, Ohio	28	20	11	11	1	1	2	2	(1)	(1)	1	0
Washington, D. C.	16	14	13	11	15	14	13	11	0	0	0	0
Wichita, Kans.	84	89	125	146	27	30	43	52	19	29	44	42
Discontinued [2]	(1)	0	0	(1)	(1)	0	0	0	0	0	0	(1)
Total	22,201	22,100	23,868	23,939	10,399	10,399	11,387	11,459	4,676	4,332	4,623	4,902

Bureau of Agricultural Economics. Compiled from data of the livestock and meat reporting service of the bureau. Early data in 1925 Yearbook, pp. 1153–1155.

Local slaughter represents number driven out from public stockyards for local slaughter.

[1] Not over 500. [2] Includes only those markets which have been totally discontinued.

TABLE 384.—*Feeder sheep: Inspected shipments from public stockyards, by months, 1927*

Origin and destination	January	February	March	April	May	June	July	August	September	October	November	December	Total
	Number	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*
Market origin:													
Chicago, Ill	39,132	31,142	17,884	2,851	23,698	20,099	21,982	58,173	106,006	111,607	45,593	38,506	516,673
Denver, Colo	53,206	33,689	23,445	5,610	826	25,744	13,820	21,907	165,125	571,923	194,308	23,580	1,133,183
East St. Louis, Ill	12	103	14	136	846	2,722	5,746	5,236	2,110	1,725	1,201	571	20,422
Fort Worth, Tex	1,417	704	1,386	2,914	9,756	6,386	4,477	5,017	15,143	7,680	5,479	2,285	62,644
Kansas City, Kans	17,093	5,864	9,808	6,354	16,080	12,151	12,171	32,702	68,904	69,198	20,829	11,708	282,862
Louisville, Ky	----	----	----	520	3,065	6,716	13,373	15,995	8,894	1,789	456	----	50,808
Omaha, Nebr	28,360	19,234	21,047	20,545	29,962	34,848	52,266	165,583	280,503	154,661	50,330	27,375	884,714
Sioux City, Iowa	5,985	5,612	1,743	1,248	3,532	1,732	4,571	5,140	9,160	33,498	17,073	6,739	96,033
South St. Joseph, Mo	4,191	2,264	885	298	2,104	4,808	7,630	19,343	30,458	23,148	7,684	3,510	106,323
South St. Paul, Minn	4,263	271	990	375	125	134	676	1,424	6,621	12,685	23,503	6,401	57,468
All other inspected	5,236	3,443	2,579	3,495	9,670	10,900	7,999	16,759	22,971	30,345	11,599	4,861	129,857
Total	158,895	102,326	79,781	44,346	99,664	126,240	144,711	347,279	715,895	1,018,259	378,055	125,536	3,340,987
State destination:													
Colorado	35,063	21,712	6,739	5,610	363	25,283	11,899	11,408	90,550	375,565	120,130	18,067	722,389
Illinois	13,008	7,036	6,616	1,307	3,351	6,540	7,566	30,201	62,546	39,967	8,842	6,106	193,146
Indiana	5,300	7,031	5,184	531	8,703	6,370	9,580	25,797	53,271	23,829	9,562	6,761	161,919
Iowa	11,173	5,154	4,498	1,778	6,949	15,021	26,364	80,331	121,782	70,871	26,191	11,210	381,322
Kansas	19,521	5,247	3,841	3,116	10,195	8,280	12,488	28,329	61,220	59,314	14,807	8,112	234,480
Kentucky	----	----	704	1,056	3,833	7,825	13,546	16,794	11,050	2,691	429	172	58,100
Michigan	17,169	17,713	6,981	1,340	11,183	7,822	11,143	9,781	20,747	48,359	28,979	21,858	203,075
Minnesota	1,198	----	281	----	----	499	480	3,431	5,813	9,413	11,516	1,620	34,251
Missouri	7,052	2,857	4,983	2,445	7,906	7,030	8,823	31,759	54,440	32,314	11,456	5,699	176,764
Nebraska	36,663	30,571	35,814	22,517	34,346	25,149	22,816	76,563	189,714	291,194	114,329	29,210	908,886
Ohio	714	734	153	10	695	984	2,192	3,473	8,865	9,250	4,582	875	32,527
South Dakota	3,162	1,482	167	----	----	76	1,043	7,406	14,746	9,847	2,826	1,737	42,492
Texas	1,667	874	1,406	2,654	6,183	4,226	3,832	2,669	3,963	6,259	4,471	2,432	40,636
Wisconsin	2,273	1,370	978	375	125	1,375	267	2,237	3,670	9,800	6,353	4,903	33,726
All other	4,932	545	1,436	1,547	5,832	9,760	12,672	17,100	13,508	29,586	13,582	6,774	117,274
Total	158,895	102,326	79,781	44,346	99,664	126,240	144,711	347,279	715,895	1,018,259	378,055	125,536	3,340,987

Bureau of Agricultural Economics. Compiled from Bureau of Animal Industry inspection records.

TABLE 385.—*Feeder sheep: Inspected shipments from public stockyards, 1920–1927*

Origin and destination	1920	1921	1922	1923	1924	1925	1926	1927
Market origin:	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*
Chicago, Ill	829, 450	530, 235	708, 987	683, 280	729, 779	590, 509	784, 144	516, 673
Denver, Colo	1, 139, 173	576, 155	953, 849	1, 001, 718	1, 091, 811	1, 022, 411	763, 821	1, 133, 183
East St. Louis, Ill	35, 978	13, 349	20, 569	17, 778	18, 473	26, 627	43, 044	20, 422
Fort Worth, Tex	59, 179	40, 693	64, 639	39, 258	60, 923	62, 150	86, 778	62, 644
Kansas City, Kans	337, 810	250, 811	242, 707	281, 318	279, 788	214, 863	281, 847	232, 862
Louisville, Ky	19, 707	24, 556	42, 388	34, 090	18, 192	26, 675	60, 984	50, 808
Omaha, Nebr	1, 156, 615	722, 272	768, 514	862, 968	866, 836	610, 915	894, 380	884, 714
Sioux City, Iowa	73, 384	50, 133	35, 382	48, 211	59, 104	56, 575	78, 897	96, 033
South St. Joseph, Mo	63, 185	38, 887	31, 927	60, 618	103, 267	52, 248	78, 145	106, 323
South St. Paul, Minn	86, 651	65, 598	46, 272	73. 027	51, 724	49, 032	61. 825	57, 468
All other inspected	132, 221	67, 019	95, 853	74, 343	74, 637	71, 699	119, 984	129, 857
Total	3, 933, 353	2, 379, 708	3, 011, 087	3, 176, 609	3, 354, 534	2, 783, 704	3, 253, 849	3, 340, 987
State destination:								
Colorado	728, 545	325, 474	678, 972	727, 336	714, 660	609, 706	357, 608	722, 389
Illinois	337, 889	197, 789	226, 474	256, 065	280, 400	248, 296	319, 977	193, 146
Indiana	125, 018	135, 241	103, 781	150, 083	165, 752	185, 582	270, 195	161, 919
Iowa	614, 664	291, 686	282, 415	404, 656	402, 861	302, 351	476, 398	381, 322
Kansas	182, 108	93, 381	140, 649	120, 080	182, 507	178, 487	189, 253	234, 480
Kentucky	31, 751	32, 106	55, 751	38, 808	22, 729	33, 179	63. 451	58, 100
Michigan	280, 028	188, 832	358, 712	313, 592	341, 083	266, 268	341, 590	203, 075
Minnesota	45, 659	42, 842	22, 311	31, 653	28, 287	32, 494	39. 570	34, 251
Missouri	236, 840	180, 908	172, 200	190, 100	197, 996	138, 326	171, 913	176, 764
Nebraska	734, 048	638, 936	692, 288	736, 323	779, 502	608, 380	705, 228	908, 886
Ohio	104, 017	82, 948	81, 353	51, 684	31, 904	25, 735	84, 826	32, 527
South Dakota	26, 393	10, 650	10, 188	13, 485	14, 005	11, 109	22, 009	42, 492
Texas	80, 673	21, 947	34, 475	16, 166	31, 319	25, 015	60, 452	40, 636
Wisconsin	82, 998	42, 886	31, 130	40, 375	55, 091	41, 157	50, 420	33, 726
All other	322, 722	94, 082	120, 388	86, 203	106, 397	77, 619	100, 959	117, 274
Total	3, 933, 353	2, 379, 708	3, 011, 087	3, 176, 609	[1]3,354,534	2, 783, 704	3, 253, 849	3, 340, 987

Bureau of Agricultural Economics. Compiled from Bureau of Animal Industry inspection records.

[1] Includes 41 head shipped to Alaska.

TABLE 386.—*Farm prices of sheep, per head, by ages, United States, January 1, 1912–1928*

Jan. 1—	Under 1 year old	Ewes 1 year and over	Wethers 1 year and over	Rams	Jan. 1—	Under 1 year old	Ewes 1 year and over	Wethers 1 year and over	Rams
	Dollars	*Dollars*	*Dollars*	*Dollars*		*Dollars*	*Dollars*	*Dollars*	*Dollars*
1912	2. 64	3. 45	3. 43	8. 26	1921	5. 33	6. 38	5. 94	15. 13
1913	3. 11	3. 98	3. 93	8. 80	1922	4. 25	4. 83	4. 05	11. 31
1914	3. 22	4. 09	4. 06	8. 49	1923	6. 80	7. 67	5. 90	14. 30
1915	3. 62	4. 59	4. 48	9. 01	1924	6. 97	8. 10	5. 98	15. 55
1916	4. 13	5. 35	5. 02	10. 32	1925	8. 53	10. 02	7. 13	16. 91
1917	5. 63	7. 48	6. 78	13. 62	1926	9. 04	11. 01	7. 32	18. 45
1918	9. 06	12. 70	11. 26	20. 84	1927	7. 91	10. 32	6. 59	18. 73
1919	8. 82	12. 44	11. 02	21. 90	1928	8. 44	10. 84	7. 39	19. 57
1920	8. 07	11. 04	9. 64	21. 94					

Bureau of Agricultural Economics. Based on returns from special price reporters.

TABLE 387.—*Sheep: Estimated price per 100 pounds received by producers, United States, 1910–1927*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Weighted av.
Average:	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1910–1913	4.58	4.52	4.80	5.10	4.99	4.76	4.52	4.31	4.26	4.18	4.15	4.23	4.55
1914–1920	7.43	7.79	8.26	8.69	8.69	8.22	7.75	7.60	7.55	7.41	7.30	7.30	7.84
1921–1925	6.26	6.56	6.85	6.92	6.71	6.28	6.13	6.04	5.99	5.97	5.99	6.28	6.35
1910	5.63	5.09	5.64	6.10	5.79	5.44	5.47	4.68	4.81	4.68	4.63	4.54	5.24
1911	4.47	4.34	4.45	4.55	4.51	4.24	4.19	3.98	3.91	3.68	3.65	3.71	4.16
1912	3.89	4.01	4.12	4.57	4.74	4.52	4.21	4.26	4.11	4.19	4.05	4.21	4.24
1913	4.35	4.63	4.97	5.16	4.91	4.84	4.20	4.32	4.23	4.16	4.27	4.46	4.55
1914	4.67	4.67	4.77	4.96	4.87	4.70	4.75	4.87	4.80	4.81	4.68	4.95	4.79
1915	4.95	5.14	5.36	5.60	5.54	5.43	5.35	5.16	5.06	5.18	5.18	5.38	5.27
1916	5.52	5.90	6.35	6.61	6.66	6.54	6.33	6.22	6.25	6.20	6.41	6.77	6.29
1917	7.33	8.17	9.21	9.69	10.15	9.84	9.32	9.33	10.05	10.24	10.20	10.44	9.45
1918	10.55	10.75	11.41	11.98	12.32	11.56	11.04	10.99	10.79	10.35	10.11	9.46	10.95
1919	9.68	9.95	10.45	11.33	10.93	10.34	9.25	9.06	8.69	8.46	8.35	8.53	9.63
1920	9.34	9.97	10.25	10.66	10.34	9.13	8.21	7.54	7.24	6.62	6.20	5.54	8.51
1921	5.30	5.01	5.27	5.11	5.11	4.74	4.34	4.38	4.11	3.96	3.84	4.10	4.65
1922	4.57	5.71	6.51	6.43	6.65	6.09	6.11	5.98	5.70	5.93	6.02	6.27	5.96
1923	6.88	6.83	7.06	7.20	6.92	6.43	6.43	6.22	6.57	6.33	6.20	6.39	6.65
1924	6.71	6.82	7.22	7.45	7.33	7.09	6.60	6.32	6.30	6.32	6.39	6.84	6.81
1925	7.86	8.41	8.20	8.42	7.53	7.04	7.17	7.32	7.27	7.31	7.51	7.79	7.70
1926	7.95	8.20	7.66	7.67	7.78	7.56	7.09	6.92	7.13	6.93	6.75	6.95	7.43
1927	6.87	7.16	7.41	7.40	7.68	7.27	7.16	7.13	7.06	7.05	7.42	7.38	7.26

Bureau of Agricultural Economics. Based on returns from special price reporters.

TABLE 388.—*Lambs: Estimated price per 100 pounds received by producers, United States, 1910–1927*

Year beginning June	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Weighted av.
Average:	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1910–1913	6.26	5.98	5.51	5.47	5.35	5.31	5.52	5.78	5.78	5.94	6.20	6.26	5.76
1914–1920	10.92	10.31	10.16	10.08	9.89	9.78	9.80	10.18	10.53	10.83	11.44	11.44	10.44
1921–1925	10.20	9.95	9.66	9.62	9.72	9.84	10.16	10.74	11.08	11.50	11.22	11.32	10.42
1910	7.13	6.71	5.70	5.85	5.78	5.54	5.60	5.71	5.44	5.49	5.77	5.74	5.79
1911	5.51	5.42	5.25	5.02	4.68	4.68	4.93	5.22	5.15	5.38	5.98	6.16	5.28
1912	6.02	5.74	5.60	5.49	5.42	5.37	5.70	6.03	6.34	6.56	6.59	6.66	5.96
1913	6.36	6.05	5.50	5.51	5.51	5.64	5.85	6.16	6.18	6.31	6.47	6.49	6.03
1914	6.47	6.55	6.26	6.27	6.09	6.14	6.33	6.47	6.67	6.06	7.35	7.32	6.49
1915	7.26	7.21	6.70	6.71	6.70	6.76	7.02	7.29	7.78	8.10	8.58	8.49	7.38
1916	8.36	8.16	8.15	8.22	8.02	8.41	8.72	9.59	10.51	11.46	12.03	12.51	9.50
1917	12.64	11.19	12.08	13.06	14.09	13.79	13.81	13.83	13.77	14.11	15.34	15.39	13.60
1918	14.98	14.20	14.20	13.73	13.20	12.54	12.44	12.71	13.17	14.03	14.61	14.34	13.65
1919	13.89	13.09	12.91	12.25	11.47	11.45	11.85	12.91	14.08	14.17	14.63	14.26	13.05
1920	12.82	11.79	10.84	10.31	9.65	9.37	8.46	8.44	7.76	7.90	7.55	7.78	9.41
1921	7.59	7.37	6.99	6.27	5.98	6.12	6.60	7.33	8.87	10.21	10.54	10.39	7.83
1922	9.87	9.55	9.39	9.43	10.06	10.30	10.49	10.69	10.83	11.01	10.69	11.00	10.30
1923	10.72	10.60	9.96	10.28	10.17	10.01	10.10	10.19	10.53	11.22	11.32	11.43	10.54
1924	11.21	10.50	10.15	10.18	10.35	10.55	10.96	12.69	13.13	13.48	12.22	11.99	11.45
1925	11.62	11.71	11.80	11.95	12.04	12.20	12.67	12.79	12.02	11.56	11.32	11.78	11.98
1926	12.07	11.52	11.12	11.32	11.31	11.11	10.92	10.65	10.84	11.55	11.97	11.92	11.36
1927	11.95	11.44	11.15	11.14	11.22	11.42	11.39	------	------	------	------	------	------

Bureau of Agricultural Economics. Based on returns from special price reporters.

TABLE 389.—*Sheep and lambs: Average price per 100 pounds Chicago, by months, 1901–1927*

SHEEP

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average[1]
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1905	5.15	5.55	5.50	5.08	4.75	4.72	5.10	4.95	4.72	5.10	5.10	5.25	5.08
1906	5.40	5.12	5.28	5.35	5.55	5.45	5.25	4.98	5.15	4.90	5.05	5.08	5.21
1907	5.15	5.20	5.50	5.65	5.78	5.90	5.32	5.32	5.18	4.82	4.38	4.18	5.20
1908	4.80	5.10	5.90	5.70	5.40	4.65	4.05	3.80	3.75	4.05	4.20	4.30	4.64
1909	4.90	5.00	5.25	5.65	6.15	5.30	4.70	4.60	4.65	4.30	4.55	4.85	4.99
1910	5.55	6.50	7.60	7.60	6.55	5.10	4.20	4.20	4.25	3.95	3.70	3.90	5.26
1911	4.10	4 15	4.70	4.20	4.45	3.80	3.95	3.50	3.80	3.65	3.45	3.55	3.94
1912	4.30	4.15	5.30	5.90	6.15	4.50	4.25	4.05	4.15	4.00	4.05	4.45	4.60
1913	5.35	5.90	6.40	6.45	5.85	5.05	4.50	4.35	4.30	4.55	4.60	4.95	5.19
1914	5.50	5.70	5.95	6.25	5.65	5.10	5.40	5.55	5.30	5.20	5.65	5.40	5.56
1915	5.80	6.45	7.45	7.70	7.35	5.50	6.05	6.25	5.75	6.00	5.85	6.20	6.36
1916	7.20	7.75	8.25	8.15	8.20	7.35	7.25	7.35	7.80	7.50	8.00	9.00	7.82
1917	10.00	11.25	11.70	12.10	13.00	10.00	9.10	9.75	11.15	11.65	11.25	11.50	11.04
1918	12.20	12.35	13.60	15.65	14.75	13.40	12.65	13.15	11.80	10.45	9.85	9.40	12.44
1919	10.35	11.35	14.05	14.50	12.25	9.30	9.70	9.75	8.30	8.15	8.30	9.60	10.47
1920	11.80	13.35	13.40	14.25	12.25	8.50	8.90	7.70	6.85	6.45	5.75	4.70	9.49
1921	5.07	4.90	6.14	6.58	6.33	4.46	5.08	4.53	4.49	4.71	4.40	4.92	5.13
1922	7.26	8.28	9.17	9.33	7.35	5.59	6.12	5.63	6.05	6.25	7.48	7.28	7.15
1923	7.72	8.08	8.64	8.90	6.74	5.00	5.16	7.09	7.25	6.35	6.89	7.37	7.10
1924	8.16	9.12	10.50	10.21	8.11	5.82	5.66	6.18	5.46	6.60	6.62	8.45	7.57
1925	10.33	9.69	9.22	7.84	7.96	6.25	7.48	6.83	6.95	7.64	8.16	9.57	8.16
1926	9.72	9.18	8.82	8.87	7.97	5.85	5.97	6.50	6.25	6.12	5.88	5.86	7.25
1927	6.94	8.03	8.88	9.62	7.44	5.88	6.25	6.47	6.14	6.00	6.40	6.41	7.04

LAMBS

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average[1]
1901	5.30	5.10	5.25	5.10	4.85	4.60	5.10	4.80	4.35	4.30	4.10	4.75	4.80
1902	5.55	6.05	6.15	6.30	6.20	5.80	5.55	5.35	4.85	4.70	4.55	4.80	5.49
1903	5.50	6.10	6.60	6.20	6.20	5.50	5.30	4.90	4.85	4.80	4.70	4.85	5.46
1904	5.55	5.40	5.30	5.60	5.70	5.60	6.15	5.45	5.15	5.15	5.50	6.25	5.57
1905	7.15	7.40	7.05	6.80	6.25	5.90	6.30	7.05	7.00	7.05	6.90	7.25	6.84
1906	7.25	6.75	6.40	6.20	6.65	6.75	6.90	7.00	7.15	6.95	6.90	7.10	6.83
1907	7.30	7.30	7.55	8.05	7.80	7.20	7.05	6.90	6.90	6.80	6.05	5.70	7.05
1908	6.80	6.70	7.20	7.25	6.65	5.75	6.20	6.05	5.35	5.50	5.85	6.70	6.33
1909	7 35	7.50	7.65	7.85	8.25	7.60	7.70	7.35	6.80	6.50	7.10	7.50	7.43
1910	8.30	8.65	9.40	9.10	8.40	7.60	7.10	6.70	6.80	6.65	6.25	6.10	7.59
1911	6.20	6.05	6.10	5.50	5.85	6.10	6.30	6.35	5.70	5.75	5.45	5.75	5.92
1912	6.50	6.15	7.30	7.95	8.30	6.90	7.25	7.10	7.00	6.75	7.15	7.75	7.18
1913	8.55	8.50	8.60	8.40	7.40	6.85	7.55	7.40	7.15	7.05	7.25	7.60	7.69
1914	7.90	7.60	7.65	7.60	8.10	7.95	8.45	8,15	7.80	7.60	8.75	8.30	7.99
1915	8.40	8.75	9.55	9.65	10.10	9.20	8.75	8.90	8.75	8.75	8.80	9.00	9.05
1916	10.30	10.90	11.10	10.45	10.75	9.55	10.55	10.75	10.60	10.15	11.40	12.70	10.77
1917	13.85	14.30	14.25	14.40	16.90	15.25	15.65	15.50	17.50	17.40	16.75	16.45	15.68
1918	17.20	16.60	17.55	19.20	18.00	16.85	18.50	17.50	17.25	15.35	15.10	14.60	16.98
1919	16.25	17.40	19.05	18.15	16.25	14.05	17.10	16.75	14.85	15.00	14.50	16.40	16.31
1920	19.50	19.95	18.80	18.80	17.40	14.25	15.55	13.20	13.30	12.35	11.70	11.20	15.50
1921	10.72	9.07	9.91	9.69	11.07	10.67	10.09	9.46	8.86	8.66	9.25	10.86	9.86
1922	12.67	14.49	15.39	14.10	12.95	12.42	13.04	12.51	13.53	13.94	14.17	14.93	13.68
1923	14.69	14.85	14.56	14.42	14.12	14.81	14.22	12.89	13.52	12.93	12.75	12.96	13.89
1924	13.53	14.95	16.06	16.22	15.23	14.12	13.79	13.57	13.38	13.52	14.03	16.47	14.57
1925	18.28	17.59	16.28	14.85	13.06	15.86	15.11	14.88	15.19	15.20	15.44	16.15	15.66
1926	15.28	13.78	13.48	14.38	15.30	16.66	14.31	14.20	14.05	13.88	13.25	12.57	14.26
1927	12.64	13 28	15.27	15.87	14.75	15.06	14.25	13.68	13.46	13.70	13.80	13.14	14.12

Bureau of Agricultural Economics. Figures prior to 1921 for sheep and lambs, compiled from Chicago Drovers Journal Yearbook; subsequent figures are bulk of sales prices from data of the livestock and meat reporting service of the bureau.

[1] Simple average of monthly prices.

TABLE 390.—*Sheep: Average price per 100 pounds at Chicago and Omaha, by months, 1920–1927*

Year and month	Chicago						Omaha					
	Lambs		Yearling wethers, medium to prime	Ewes		Feeder lambs, medium to choice	Lambs		Yearling wethers, medium to prime	Ewes		Feeder lambs, medium to choice
	84 lbs. down, medium to prime	All weights, cull and common		Medium to choice	Cull and common		84 lbs. down, medium to prime	All weights, cull and common		Medium to choice	Cull and common	
1920	*Dolls.*	*Dolls.*	*Do ls.*	*Dollars*	*Dollars*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dollarrs*	*Dollars*	*Dolls.*
January	18.90	15.75	16.16	10.84	7.38	16.87	18.80	15.67	15.52	10.68	7.73	16.72
February	19.37	16.05	17.07	12.42	8.34	17.29	19.05	16.04	16.15	11.68	8.51	17.03
March	18.67	15.61	16.54	12.80	8.34	16.40	18.36	15.41	16.01	12.63	8.85	16.18
April	18.72	15.33	16.23	12.55	8.22	15.38	18.23	15.30	15.83	12.69	7.94	15.73
May	17.00	13.12	14.14	10.89	6.77	12.97	16.75	13.61	13.84	10.28	6.76	13 36
June	15.38	11.49	12.38	7.08	4.43	11.61	15.43	11.94	12.20	7.29	4.35	11.85
July	14.42	9.93	11.38	7.24	4.22	12.49	14.13	9.88	10.88	6.32	3.60	11.86
August	12.71	9.25	9.68	7.08	4.21	11.66	12.03	8.99	8.77	6.08	3.38	11.48
September	12.93	9.81	9.70	6.21	4.02	12.77	12.43	9.48	8.58	5.83	3.43	12.05
October	11.78	8.95	9.50	5.52	3.45	11.77	11.49	9.00	8.45	5.04	2.97	11.44
November	11.59	9.44	9.70	5.45	3.62	12.04	11.00	8.72	8.63	5.31	3.17	10.38
December	11.11	8 87	8.70	4.52	2.72	9.91	10.24	8.12	7.64	4.28	3.24	8.70
Average	15.22	11.97	12.60	8.55	5.48	13.43	14.83	11.85	11.88	8.18	5.33	13.06
1921												
January	10.66	8.49	8.82	4.77	2.57	9.21	10.32	8.13	7.67	4.54	2.65	9.18
February	9.03	6.85	6.82	4.54	2.74	7.55	8.48	6.14	6.19	4.35	2.45	6.92
March	9.73	7.65	8.14	5.79	3.30	8.24	9.40	7.23	7.46	5.57	3.48	7.09
April	9.88	8.20	8.40	6.11	3.42	7.64	9.43	7.77	7.46	6.15	3.59	7.92
May	10.76	8.28	8.88	6.06	3.38	7.69	10.44	8.46	8.22	6.00	3.53	7.83
June	10.49	6.93	7.99	3.84	1.80	-------	9.82	6.77	7.56	3.50	1.87	6.33
July	9.70	6.54	7.23	4.21	1.94	6.50	9.35	6.44	6.48	4.22	2.00	6.33
August	9.14	6.33	6.94	4.10	2.18	7.15	8.65	6.15	5.96	3.76	1.81	6.81
September	8.50	6.13	6.16	3.86	2.23	6.52	8.07	5.85	5.27	3.45	2.08	6.15
October	8.40	6.26	6.30	4.11	2.18	7.09	7.91	5.86	5.77	3.91	2.19	6.83
November	9.05	7.09	6.88	3.80	2.07	7.85	8.61	6.92	6.11	3.64	1.94	7.60
December	10.65	8.67	8.48	4.47	2.46	9.40	10.09	8.30	7.42	4.01	2.20	8.82
Average	9.67	7.28	7.59	4.64	2.52	-------	9.21	7.00	6.80	4.42	2.48	7.39
1922												
January	12.22	10.15	10.40	5.98	3.42	10.86	11.54	9.62	9.41	5.48	3.23	10.24
February	13.84	11.11	11.78	6.79	3.82	12.17	13.50	11.12	11.20	6.56	3.91	12.17
March	14.61	11.71	12.75	8.17	4.87	12.62	14.23	11.49	11.62	7.78	4.71	12.77
April	13.62	10.88	11.87	8.26	4.94	-------	14.43	11.71	12.35	8.38	5.25	12.60
May	12.45	9.31	10.18	6.32	3.44	-------	12.34	9.35	9.81	6.30	3.60	11.68
June	11.90	8.46	9.58	4.96	2.31	11.42	11.77	8.64	9.40	4.49	2.18	10.50
July	12.88	9.67	10.10	6.01	3.12	12.20	12.53	9.60	10.12	5.56	2.96	10.72
August	12.38	9.96	9.83	5.55	2.98	12.08	12.11	9.63	9.24	5.33	2.89	10.91
September	13.33	10.58	10.25	5.20	2.74	12.85	13.04	10.55	9.62	4.91	2.87	12.34
October	13.50	10.53	10.62	5.53	3.26	13 71	12.98	10.13	9.86	4.98	2.67	12.92
November	13.79	10.92	11.21	6.34	3.96	13.18	13.21	10.56	10.68	5.97	3.43	12.38
December	14.29	11.16	11.20	6.40	3.85	13.70	13.86	11.12	10.84	6.05	3.22	13.28
Average	13.28	10.37	10.81	6.29	3.56	-------	12.96	10.29	10.35	5.98	3.41	11.88
1923												
January	14.06	11.25	11.19	6.79	4.75	13.89	13.74	11.02	10.83	6.32	3.82	13.67
February	14.24	11.38	11.56	7.05	4.94	14.34	13.79	11.15	11.00	6.65	4.16	14.00
March	14.24	11.62	11.69	7.74	5.28	14.20	13.69	11.20	11.34	7.58	5.02	13.76
April	13.76	11.17	11.64	8.10	5.40	-------	13.55	11.25	11.37	7.88	5.24	13.26
May	13.67	10.89	10.77	6.27	3.51	-------	13.29	10.82	10.35	6.33	3.26	------
June	14.02	10.77	11.48	4.96	2.64	-------	13.86	10.86	10.98	4.38	2.16	------
				Common to choice	Canner and cull					Common to choice	Canner and cull	
July	13.54	9.98	10.92	5.13	2.05	12.02	13.01	9.70	10.66	4.62	2.00	10.99
August	12.07	9.51	9.73	6.04	2.56	12.08	11.96	9.23	9.45	5.35	2.25	11.21
September	12.86	10.33	9.92	5.44	2.39	12.74	12.25	9.81	9.38	4.66	2.08	12.28
October	12.30	9.90	9.70	5.21	2.38	12.24	12.14	9.94	9.07	4.69	2.18	11.94
November	11.94	9.84	9.62	5.44	2.56	11.98	11.72	9.64	9.17	5.05	2.48	11.60
December	12.18	10.00	9.75	6.01	2.97	11.70	11.68	9.56	9.55	5.70	2.80	11.32
Average	13.24	10.55	10.66	-------	-------	-------	12.89	10.35	10.26	-------	-------	------

TABLE 390.—*Sheep: Average price per 100 pounds at Chicago and Omaha, by months, 1920–1927*—Continued

Year and month	Chicago: Lambs: 84 lbs. down, medium to prime	Chicago: Lambs: All weights, cull and common	Chicago: Yearling wethers, medium to prime	Chicago: Ewes: Common to choice	Chicago: Ewes: Canner and cull	Chicago: Feeder lambs, medium to choice	Omaha: Lambs: 84 lbs. down, medium to prime	Omaha: Lambs: All weights, cull and common	Omaha: Yearling wethers, medium to prime	Omaha: Ewes: Common to choice	Omaha: Ewes: Canner and cull	Omaha: Feeder lambs, medium to choice
1924	*Dolls.*	*Dolls*	*Dolls.*	*Dolls.*	*Dolls.*	*Dollars*	*Dolls.*	*Dolls*	*Dolls.*	*Dolls.*	*Dolls.*	*Dollars*
Jan	12.95	10.70	10.61	6.73	3.39	12.18	12.25	9.89	10.03	6.29	3.08	12.07
Feb	14.37	11.73	11.97	7.70	4.08	13.22	13.54	10.89	11.10	7.34	3.77	13.10
Mar	15.36	12.65	13.10	9.03	5.04	14.67	14.82	12.04	12.41	8.64	4.62	14.40
Apr	15.63	12.91	13.44	9.09	5.02	[1] 14.92	15.15	12.37	12.80	8.67	4.67	------------
May	14.68	11.96	12.32	6.70	3.27	------------	14.08	11.23	11.48	6.07	2.84	------------
June	13.62	10.48	11.18	4.79	2.21	11.39	12.91	10.02	10.61	4.50	2.02	11.31
July	13.10	10.00	10.58	4.91	2.13	11.32	12.63	9.60	10.03	4.62	2.15	10.96
Aug	12.90	10.04	9.95	5.65	2.37	12.17	12.58	9.94	9.61	5.14	2.44	11.73
Sept	12.81	10.01	9.43	5.00	2.19	12.08	12.47	9.74	8.72	4.74	2.32	11.74
Oct	13.15	10.76	9.73	5.56	2.50	12.31	12.80	10.28	8.78	5.07	2.40	12.13
Nov	13.58	11.31	10.50	6.38	2.97	13.12	13.16	10.90	9.64	5.93	2.65	12.44
Dec	15.67	12.87	12.75	7.39	3.86	14.54	15.00	12.59	11.84	7.49	3.97	13.99
Av	13.99	11.28	11.30	6.58	3.25	------------	13.45	10.79	10.59	6.21	3.08	------------
1925												
Jan	17.28	14.55	15.12	8.88	5.11	16.30	16.68	14.24	13.88	8.62	5.00	15.81
Feb	16.79	14.38	14.53	7.98	4.56	16.50	16.14	13.87	13.80	7.76	4.36	15.99
Mar	16.04	13.73	13.45	8.37	4.79	16.22	15.48	13.12	12.87	8.38	4.79	15.32
Apr	14.62	12.45	11.22	7.63	4.41	14.27	14.20	12.27	10.79	7.45	4.23	13.12
May	12.72	10.50	10.28	6.74	3.30	------------	12.37	10.20	9.18	6.28	2.75	------------
June	15.06	12.16	12.38	5.80	2.82	------------	14.59	12.17	11.90	5.35	2.51	------------
	Medium to choice		Medium to choice				Medium to choice		Medium to choice			
July	14.69	12.12	11.72	6.64	3.11	[1] 14.24	14.09	11.67	11.18	5.92	3.01	13.18
Aug	14.47	12.36	11.08	6.42	3.00	14.66	14.08	11.94	10.78	5.78	2.75	14.03
Sept	14.73	12.50	11.13	6.36	3.01	14.85	14.22	11.86	10.64	5.88	2.80	14.30
Oct	14.71	12.30	11.43	6.37	3.00	14.98	14.32	11.77	10.70	6.13	2.88	14.48
Nov	15.03	12.61	11.51	6.57	3.12	14.73	14.42	12.04	10.90	6.28	2.89	14.79
Dec	15.74	13.31	12.24	7.50	3.81	15.69	15.31	13.00	11.76	7.12	3.70	14.98
Av	------	12.75	------	7.10	3.67	------------	------	12.35	------	6.75	3.47	------------
1926												
Jan	14.80	12.88	12.00	7.54	3.83	15.02	14.06	12.14	11.36	6.99	3.61	14.34
Feb	13.52	12.11	11.11	7.29	3.73	13.74	12.69	11.29	10.33	6.52	3.21	13.17
Mar	13.32	11.39	10.56	7.26	3.75	13.27	12.60	10.92	9.85	6.65	3.10	12.23
Apr	13.87	12.09	11.86	7.86	4.08	12.97	13.70	12.06	10.58	7.41	3.66	12.94
May	14.51	12.23	12.48	6.79	3.60	------------	14.26	12.26	11.58	6.47	3.12	------------
June	15.83	12.81	13.31	5.71	3.09	13.21	14.95	12.46	12.78	5.30	2.75	12.79
					Cull						Cull	
July	13.72	11.12	11.76	5.88	3.10	12.90	13.22	10.63	10.38	5.43	2.86	12.69
Aug	13.56	10.34	11.08	6.19	3.36	12.79	13.14	10.42	9.96	5.69	3.17	12.69
Sept	13.44	10.57	10.85	5.89	3.28	13.14	12.81	10.00	9.75	5.49	2.94	12.54
Oct	13.37	10.56	11.14	5.92	3.40	12.93	12.86	10.26	9.92	5.46	2.78	12.47
Nov	13.04	10.20	10.70	5.66	3.10	12.50	12.40	9.82	9.31	5.25	2.50	12.10
Dec	12.12	9.30	9.32	5.54	2.92	11.76	11.72	9.22	8.82	5.17	2.50	11.89
Av	13.76	11.30	11.35	6.46	------	------------	13.20	10.96	10.38	5.99	------	------------

[1] 2-week average in 5-week month.

TABLE 390—*Sheep: Average price per 100 pounds at Chicago and Omaha, by months, 1920–1927*—Continued

Year and month	Chicago							Omaha						
	Lambs		Yearling wethers, medium to prime	Ewes		Feeder lambs, medium to choice		Lambs		Yearling wethers, medium to prime	Ewes		Feeder lambs, medium to choice	
	84 lbs. down, medium to prime	All weights, cull and common		Common to choice	Canner and cull			84 lbs. down, medium to prime	All weights, cull and common		Common to choice	Canner and cull		
1927	*Dolls.*	*Dolls*	*Dolls.*	*Dolls.*	*Dolls.*	*Dollars*		*Dolls.*	*Dolls*	*Dolls.*	*Dolls.*	*Dolls.*	*Dollars*	
Jan.	12.10	10.10	10.07	6.34	3.44	12.20		11.53	9.23	8.99	5.66	3.01	12.10	
Feb.	12.79	10.83	10.85	7.74	4.39	12.57		12.37	10.49	10.12	7.39	4.24	12.55	
Mar.	14.82	12.45	12.50	8.44	4.90	13.94		14.25	12.12	11.82	8.27	4.78	13.97	
Apr.	15.36	12.92	13.15	8.70	5.14	14.00		14.90	12.72	12.46	8.15	4.78	14.04	
May	14.49	12.25	12.87	6.87	3.82	----		14.01	11.90	11.98	6.31	3.52	12.78	
June	15.33	12.43	12.80	5.61	3.03	12.75		14.65	12.16	11.93	4.93	2.76	12.19	
	Good and choice		110 lbs. down, medium to choice	120 lbs. down, medium to choice	Cull and common	Good and choice	Medium	Good and choice		110 lbs. down, medium to choice	120 lbs. down, medium to choice	Cull and common	Good and choice	Medium
July	14.18	10.79	10.83	5.97	3.25	12.94	11.85	13.66	10.17	10.18	5.73	3.16	12.83	11.87
Aug.	13.49	10.27	10.42	5.90	3.12	13.02	11.90	13.07	9.91	9.59	5.75	3.16	13.13	12.15
Sept.	13.38	10.46	10.25	5.06	2.56	13.40	12.38	12.94	9.96	9.09	5.36	2.88	13.16	12.06
Oct.	13.68	11.01	10.98	5.60	3.04	14.04	13.26	13.09	10.34	9.25	5.38	3.00	13.31	12.22
Nov.	13.88	11.38	11.16	5.93	3.35	14.03	13.30	13.27	10.92	9.59	5.52	3.05	13.45	12.45
Dec.	13.38	10.68	10.49	6.04	3.40	13.35	12.56	12.81	10.15	9.45	5.88	3.15	12.46	11.74

Bureau of Agricultural Economics. Compiled from data of the livestock and meat reporting service of the bureau.

TABLE 391.—*Sheep and lambs: Monthly slaughter under Federal inspection, 1907–1927*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
	Thousands	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
1907	1,017	837	842	861	769	735	865	900	892	973	793	769	10,252
1908	872	725	677	664	732	842	891	932	1,064	1,048	928	930	10,305
1909	906	806	903	839	712	843	964	1,019	1,153	1,169	1,029	1,000	11,343
1910	903	771	727	693	796	927	967	1,095	1,154	1,206	1,125	1,014	11,408
1911	1,130	1,019	1,059	974	1,085	1,146	1,150	1,268	1,257	1,428	1,304	1,200	14,020
1912	1,383	1,151	1,106	971	963	1,028	1,181	1,390	1,440	1,723	1,424	1,220	14,979
1913	1,192	961	883	1,049	1,127	1,135	1,273	1,243	1,486	1,514	1,258	1,281	14,406
1914	1,297	1,113	1,143	1,150	1,085	1,113	1,171	1,169	1,379	1,331	1,112	1,167	14,229
1915	1,196	946	986	830	739	883	984	1,139	1,220	1,116	1,132	1,041	12,212
1916	976	904	861	769	854	990	930	1,173	1,158	1,172	1,121	1,033	11,941
1917	956	819	861	777	632	710	688	766	740	822	764	809	9,345
1918	780	655	736	614	659	737	869	937	1,029	1,194	1,139	971	10,320
1919	1,004	754	738	808	894	931	1,160	1,234	1,292	1,414	1,227	1,235	12,691
1920	955	828	788	714	671	818	1,048	1,042	1,151	1,068	968	932	10,982
1921	1,068	958	1,075	1,041	935	1,116	1,060	1,237	1,249	1,285	1,040	890	13,005
1922	954	776	837	739	872	1,028	964	1,024	1,013	981	882	858	10,929
1923	1,021	836	977	960	972	914	962	957	990	1,046	915	978	11,529
1924	1,083	912	868	860	959	975	1,051	1,063	1,150	1,148	950	972	11,991
1925	990	854	984	1,012	1,030	999	1,071	1,031	1,086	1,083	879	981	12,001
1926	1,039	988	1,163	994	959	1,081	1,042	1,093	1,224	1,167	1,039	1,172	12,961
1927	1,115	1,006	1,027	960	992	1,058	1,014	1,168	1,185	1,194	1,070	1,094	12,882

Bureau of Animal Industry.

TABLE 392.—*Mutton and lamb, frozen: Cold-storage holdings, United States, 1916–1927*

Year	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sept. 1	Oct. 1	Nov. 1	Dec. 1
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Average:												
1916–1920	8, 063	7, 329	6, 482	5, 115	4, 355	4, 669	4, 068	3, 744	5, 547	8, 853	14, 639	17, 110
1921–1925	16, 888	18, 524	41, 478	10, 368	7, 413	5, 364	4, 088	3, 283	2. 927	2, 964	3, 379	3, 608
1916	4, 976	5, 286	5, 812	5, 084	3, 858	2, 525	1, 939	2, 098	2, 135	2, 579	3, 465	5, 000
1917	4, 886	5. 895	4, 949	4, 872	4, 369	3, 508	4, 380	3, 912	2, 716	2, 768	4, 194	5, 406
1918	7, 403	6, 315	7, 855	5, 599	3, 348	3, 860	2, 429	3, 150	4, 046	5, 275	8, 645	9, 035
1919	12, 760	11, 360	8, 013	6, 505	7, 623	7, 718	7, 279	7, 263	7. 817	8, 318	7, 894	9, 409
1920	10, 290	7, 787	5, 781	3, 517	2, 579	5, 735	4, 311	2. 299	11, 021	25, 325	48, 997	56, 702
1921	68, 032	78, 082	59, 304	38, 520	25, 129	15, 877	8. 714	6, 751	5, 903	5, 993	6, 840	7, 520
1922	6, 444	3, 914	2, 863	2, 873	2, 071	2, 310	3, 720	3, 308	3, 376	3, 473	3, 458	3, 633
1923	4, 523	5, 980	5, 758	6, 635	5, 774	4, 445	3, 556	2, 752	1, 785	1, 719	1, 997	2, 014
1924	2, 493	2, 306	2, 173	1, 719	2, 093	2, 273	2, 917	2, 257	2, 230	2, 525	3, 166	3, 326
1925	2, 949	2, 336	2, 294	2, 090	1, 998	1, 913	1, 535	1, 349	1, 339	1, 112	1, 435	1, 549
1926	1, 820	2, 354	3, 346	3, 289	2, 393	1, 697	1, 871	1, 813	1, 929	2, 234	2, 814	3, 166
1927	4, 556	4, 447	4, 074	2, 940	1, 862	1, 210	1, 360	1, 161	1, 302	1, 991	2, 958	3, 790

Bureau of Agricultural Economics. Compiled from reports from cold-storage establishments.

TABLE 393.—*Sheep and lambs: Statement of livestock and meat situation, 1921–1927*

Item	Unit	1921	1922	1923	1924	1925	1926	1927
Federally inspected slaughter.	Thousands	13, 005	10, 929	11, 529	11, 991	12, 001	12, 961	12, 883
Average live weight	Pounds	79. 68	79. 99	80. 80	80. 14	81. 58	81. 34	81. 66
Total live weight	1,000 pounds	1, 036, 231	874, 206	931, 507	960, 945	979, 041	1, 054, 238	1, 052, 029
Average live cost per 100 pounds.	Dollars	8. 61	12. 18	12. 03	12. 77	14. 22	12. 86	12. 97
Total live cost	1,000 dollars	89, 219	106, 478	112, 060	122, 713	139, 220	135, 575	136, 448
Carcasses condemned	Thousands	11	12	14	13	14	16	16
Number passed for food	do	12, 994	10, 917	11, 515	11, 978	11, 987	12, 945	12, 867
Average dressed weight	Pounds	37. 92	38. 34	38. 83	38. 10	39. 00	38. 74	38. 99
Total dressed weight	1,000 pounds	493, 154	417, 842	446, 260	456, 357	467, 316	500. 888	501, 746
Mutton and lamb:								
Imports	do	25, 395	12, 155	5, 215	2, 166	2, 770	3, 365	2, 646
Storage Jan. 1	do	68, 032	6, 444	4, 523	2, 493	2, 949	1, 820	4, 556
Total supply	do	586, 581	436, 441	455, 998	461, 016	473, 035	506, 073	508, 947
Storage Dec. 31	do	6, 444	4, 523	2, 493	2, 949	1, 820	4, 556	4, 408
Exports [1]	do	64, 104	1, 957	2, 124	1, 507	1, 541	1, 230	971
Apparent domestic consumption.	do	516, 033	429, 962	451, 381	456, 560	469, 674	500, 288	503, 569
Apparent per capita consumption.	Pounds	4. 76	3. 91	4. 04	4. 01	4. 07	4. 27	4. 24

Bureau of Agricultural Economics.

[1] Includes reexports.

TABLE 394.—*Mutton and lamb: International trade, average 1911–1913, annual*

Country	Year ended Dec. 31									
	Average, 1911–1913		1923		1924		1925		1926, preliminary	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
PRINCIPAL EXPORTING COUNTRIES	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Argentina	--------	148, 457	--------	175, 208	--------	184, 311	--------	202, 576	--------	148, 213
Australia	7	149, 958	[1] 34	[1] 167, 613	[1] 37	[1] 39, 805	[1] 47	[1] 50, 271	[1] 2	[1] 85, 682
Canada	4, 717	48	1, 350	1, 707	1, 367	922	1, 321	2, 641	1, 673	1, 274
Netherlands	76	17, 212	2, 293	14, 138	1, 347	17, 566	1, 069	17, 082	1, 472	14, 308
New Zealand	--------	235, 509	--------	249, 954	--------	278, 426	1	291, 039	--------	279, 731
Union of South Africa	1, 914	75	73	179	46	176	1	184	--------	175
Uruguay	--------	3, 262	--------	34, 509	--------	34, 417	--------	22, 658	--------	50, 328
PRINCIPAL IMPORTING COUNTRIES										
Belgium	([2])	([2])	2, 013	318	2, 975	489	2, 905	829	3, 128	1, 154
Denmark	3, 828	344	1, 651	211	1, 106	61	1, 328	35	2, 214	2
France	930	334	20, 555	813	24, 475	251	23, 737	200	20, 474	146
Germany	1, 046	350	2, 902	45	3, 156	711	3, 002	2, 122	8, 217	361
Hong Kong	--------	--------	457	2	502	3	[3] 133	[3] 1	--------	--------
Sweden	1, 218	100	422	167	651	105	731	60	1, 148	7
United Kingdom	596, 899	--------	663, 147	--------	577, 176	--------	622, 482	--------	613, 633	--------
United States	185	4, 146	5, 215	2, 087	2, 166	1, 445	2, 770	1, 464	3, 365	1, 171
Total, 15 countries	610, 820	559, 795	700, 112	646, 951	615, 004	558, 688	658, 527	591, 162	655, 326	582, 552

Bureau of Agricultural Economics. Official sources.

[1] Year ended June 30. [2] Not separately stated. [3] 6 months.

TABLE 395.—*Wool, raw: Production, imports, exports, and apparent consumption, United States, 1910–1927*

Year	Production			Imports [1]	Reexports [1]	Net imports	Exports of domestic wool	Excess of imports over all exports [1]	Apparent consumption
	Fleece	Pulled	Total						
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
1910	281, 363	40, 000	321, 363	180, 135	9, 055	171, 080	[2] 48	171, 032	492, 395
1911	277, 548	41, 000	318, 548	155, 923	3, 511	152, 412	([3])	152, 412	470, 960
1912	262, 543	41, 500	304, 043	238, 118	1, 816	236, 302	([4])	236, 302	540, 345
1913	252, 675	43, 500	296, 175	151, 581	3, 860	147, 721	[2] 77	147, 644	443, 819
1914	247, 192	43, 000	290, 192	256, 501	6, 342	250, 159	[2] 335	249, 823	540, 015
1915	245, 726	40, 000	285, 726	402, 611	2, 081	400, 530	[2] 8, 158	392, 372	678, 098
1916	244, 890	43, 600	288, 490	442, 650	2, 128	440, 522	3, 919	436, 603	725, 093
1917	241, 892	40, 000	281, 892	416, 137	1, 272	414, 865	1, 827	413, 038	694, 930
1918	256, 870	42, 000	298, 870	447, 426	452	446, 974	407	446, 567	745, 437
1919	249, 958	48, 300	298, 258	438, 782	5, 134	433, 647	2, 840	430, 807	729, 065
1920	244, 179	42, 900	287, 079	254, 905	12, 393	242, 512	8, 845	233, 666	520, 745
1921	235, 129	48, 500	283, 629	316, 605	1, 552	315, 053	1, 927	313, 126	596, 755
1922	221, 713	42, 000	263, 713	366, 538	4, 225	362, 314	453	361, 861	625, 574
1923	225, 696	42, 500	268, 196	388, 345	23, 557	364, 788	535	364, 253	632, 449
1924	235, 575	43, 800	279, 375	262, 655	27, 476	235, 179	309	234, 869	514, 244
1925	245, 562	46, 800	292, 362	336, 646	7, 087	329, 559	273	329, 286	621, 648
1926	260, 976	50, 600	311, 576	299, 451	14, 075	285, 376	292	285, 084	596, 660
1927 [5]	272, 453	--------	--------	--------	--------	--------	--------	--------	--------

Bureau of Agricultural Economics. Production figures 1910–1913 from the National Association of Wool Manufacturers; 1914–1926 from the bureau; imports and exports from the Bureau of Foreign and Domestic Commerce.

[1] Hair of Angora goat, alpaca, and other like animals included in imports and reexports prior to 1914 and in exports for all years.
[2] Exports for fiscal years ended June 30 of the years shown.
[3] Included in all other articles.
[4] No transactions.
[5] Preliminary.

TABLE 396.—*Wool, fleece: Estimated production, by States, 1924–1927*

State	Production				Weight per fleece [1]				Number of fleeces			
	1924	1925	1926	1927	1924	1925	1926	1927	1924	1925	1926	1927
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
Maine	493	526	559	546	6.4	6.5	6.5	6.5	77	81	86	84
New Hampshire	94	102	110	117	6.3	6.4	6.5	6.5	15	16	17	18
Vermont	277	252	277	285	7.3	7.2	7.3	7.3	38	35	38	39
Massachusetts	67	68	62	63	6.1	6.2	6.2	6.3	11	11	10	10
Rhode Island	12	12	12	12	6.1	6.2	6.2	6.2	2	2	2	2
Connecticut	41	41	43	36	5.8	5.9	6.1	6.0	7	7	7	6
New York	2,708	2,898	3,081	2,956	7.3	7.3	7.3	7.3	371	397	422	405
New Jersey	31	31	32	32	6.2	6.2	6.3	6.3	5	5	5	5
Pennsylvania	2,766	2,805	2,805	2,730	7.6	7.5	7.5	7.5	364	374	374	364
Ohio	14,167	14,467	14,760	15,662	8.1	8.1	8.2	8.2	1,749	1,786	1,800	1,910
Indiana	3,391	3,562	3,715	4,088	7.2	7.3	7.4	7.3	471	488	502	560
Illinois	3,334	3,419	3,648	4,162	7.2	7.4	7.6	7.5	463	462	480	555
Michigan	6,880	7,416	7,920	8,272	8.0	8.0	8.0	8.0	860	927	990	1,034
Wisconsin	2,109	2,250	2,508	2,774	7.4	7.5	7.6	7.6	285	300	330	365
Minnesota	2,886	3,151	3,634	4,211	7.8	7.8	7.9	7.9	370	404	460	533
Iowa	5,360	5,360	5,440	5,896	8.0	8.0	8.0	8.0	670	670	680	737
Missouri	5,236	5,208	5,250	5,460	7.0	7.0	7.0	7.0	748	744	750	780
North Dakota	1,853	2,263	2,772	3,187	8.2	8.2	8.3	8.3	226	276	334	384
South Dakota	4,312	4,446	4,714	5,160	7.7	7.8	8.1	8.0	560	570	582	645
Nebraska	1,998	2,212	2,175	2,081	7.4	7.5	7.5	7.7	270	295	290	270
Kansas	1,399	1,656	1,679	1,986	7.1	7.2	7.3	7.3	197	230	230	272
Delaware	12	12	12	12	6.0	6.0	6.0	6.0	2	2	2	2
Maryland	433	439	472	504	6.1	6.1	6.3	6.3	71	72	75	80
Virginia	1,398	1,485	1,630	1,710	4.6	4.7	5.0	5.0	304	316	326	342
West Virginia	2,236	2,272	2,311	2,457	5.2	5.2	5.3	5.4	430	437	436	455
North Carolina	284	270	304	350	4.5	4.5	4.6	4.8	63	60	66	73
South Carolina	47	48	45	50	3.9	4.0	4.1	4.2	12	12	11	12
Georgia	143	131	139	148	3.4	3.2	3.4	3.6	42	41	41	41
Florida	137	147	144	144	2.8	3.0	3.0	3.0	49	49	48	48
Kentucky	2,880	3,125	3,278	3,845	4.5	4.8	4.8	4.8	640	651	683	801
Tennessee	1,136	1,144	1,118	1,174	4.1	4.3	4.3	4.3	277	266	260	273
Alabama	170	155	136	155	3.4	3.3	3.5	3.6	50	47	39	43
Mississippi	323	304	288	198	3.2	3.2	3.2	3.2	101	95	90	62
Arkansas	225	202	201	220	4.5	4.7	4.9	4.9	50	43	41	45
Louisiana	304	294	275	286	3.2	3.3	3.2	3.4	95	89	86	84
Oklahoma	385	394	456	562	7.4	7.3	7.6	7.7	52	54	60	73
Texas	24,806	25,280	27,297	32,675	7.9	8.0	8.1	8.5	3,140	3,160	3,370	3,850
Montana	19,522	20,640	23,320	24,229	8.6	8.6	8.8	8.6	2,270	2,400	2,650	2,824
Idaho	14,450	14,309	14,507	15,120	8.5	8.2	8.9	8.4	1,700	1,745	1,630	1,800
Wyoming	19,090	21,362	22,338	25,000	8.3	8.6	8.5	8.6	2,300	2,484	2,628	2,910
Colorado	6,486	6,862	7,740	8,118	6.9	7.3	7.5	7.3	940	940	1,032	1,112
New Mexico	11,224	11,084	12,060	12,600	6.1	5.8	5.9	6.0	1,840	1,911	2,044	2,100
Arizona	6,448	6,458	6,758	6,336	6.2	6.3	6.2	6.0	1,040	1,025	1,090	1,056
Utah	17,970	18,010	19,430	19,975	8.3	8.4	8.8	8.5	2,165	2,144	2,208	2,350
Nevada	7,597	7,560	8,730	8,015	7.8	7.2	7.9	7.3	974	1,050	1,105	1,098
Washington	4,365	4,560	4,194	4,770	9.7	9.5	9.8	9.8	450	480	428	485
Oregon	15,840	16,958	18,321	18,128	8.8	8.8	9.3	8.8	1,800	1,927	1,970	2,060
California	18,250	19,912	20,276	21,540	7.3	7.5	7.4	7.5	2,500	2,655	2,740	2,872
United States	235,575	245,562	260,976	278,037	7.6	7.6	7.8	7.7	31,116	32,235	33,548	35,929

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

[1] In States where sheep are shorn twice a year this figure covers wool per head of sheep shorn and not weight per fleece.

Table 397.—*Stocks of wool, tops, and noils held by dealers and manufacturers in United States, 1920–1927* [1]

Date	Held by dealers					Held by manufacturers				
	Grease	Scoured	Pulled	Tops	Noils	Grease	Scoured	Pulled	Tops	Noils
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
1920										
Jan. 1	152, 003	24, 630	17, 907	4, 735	3, 893	152, 089	20, 030	6, 302	13, 875	7, 316
Apr. 1	123, 247	26, 279	17, 710	3, 646	4, 305	139, 333	24, 412	9, 339	14, 328	8, 670
July 1	144, 837	27, 963	15, 207	4, 487	6, 041	112, 434	23, 078	6, 762	15, 439	9, 002
Oct. 1	179, 376	29, 988	11, 229	5, 564	4, 754	79, 762	15, 612	7, 593	15, 839	9, 124
1921										
Jan. 1	188, 822	27, 814	14, 352	6, 616	5, 434	119, 766	17, 291	6, 895	18, 851	9, 991
Apr. 1	194, 891	22, 807	15, 505	7, 623	3, 690	165, 398	18, 442	11, 296	19, 325	9, 316
July 1	176, 584	19, 703	12, 127	4, 883	4, 139	164, 713	18, 042	10, 787	20, 247	8, 101
Oct. 1	181, 574	19, 480	11, 201	4, 005	3, 009	180, 727	19, 736	10, 484	23, 184	7, 463
1922										
Jan. 1	102, 384	13, 468	9, 222	2, 866	2, 453	171, 597	21, 097	9, 312	17, 536	7, 136
Apr. 1	70, 415	10, 995	6, 969	2, 296	1, 373	171, 026	25, 406	10, 419	18, 029	7, 176
July 1	156, 523	13, 447	6, 988	2, 627	1, 619	165, 810	22, 201	9, 642	20, 720	6, 709
Oct. 1	176, 377	16, 521	7, 384	3, 327	2, 695	191, 351	20, 336	8, 686	19, 227	5, 904
1923										
Jan. 1	134, 644	22, 150	11, 106	3, 658	6, 158	193, 492	20, 596	8, 824	20, 211	7, 644
Apr. 1	126, 158	24, 734	13, 503	3, 378	6, 378	175, 422	21, 787	11, 930	18, 402	8, 247
July 1	186, 729	21, 075	13, 126	5, 125	5, 977	161, 435	18, 464	11, 148	16, 579	8, 364
Oct. 1	175, 843	21, 679	10, 531	3, 136	5, 675	130, 935	15, 992	8, 960	16, 998	7, 511
1924										
Jan. 1	144, 014	16, 665	7, 700	2, 988	3, 783	121, 173	16, 947	8, 971	16, 543	7, 206
Apr. 1	100, 846	16, 239	9, 561	4, 172	1, 806	124, 345	15, 310	7, 669	17, 141	6, 828
July 1	154, 931	12, 840	8, 829	4, 461	983	126, 985	13, 987	6, 140	16, 323	5, 659
Oct. 1	132, 953	12, 544	7, 475	3, 869	1, 994	129, 330	15, 165	6, 747	16, 562	4, 867
1925										
Jan. 1	98, 712	18, 380	9, 799	3, 285	2, 583	113, 026	15, 315	7, 368	16, 258	6, 729
Apr. 1	65, 912	16, 819	12, 624	2, 754	2, 412	95, 122	15, 437	7, 025	15, 921	6, 020
July 1	147, 654	15, 039	11, 267	2, 571	3, 292	95, 021	16, 455	7, 381	15, 252	5, 463
Oct. 1	136, 043	15, 809	9, 715	2, 240	2, 704	102, 261	13, 621	6, 623	15, 880	6, 207
1926										
Jan. 1	117, 726	14, 658	10, 552	2, 428	2, 407	97, 162	12, 666	7, 852	15, 346	6, 121
Apr. 1	97, 552	15, 053	12, 360	2, 692	2, 641	95, 102	14, 358	7, 468	15, 188	6, 184
July 1	182, 085	12, 204	10, 141	2, 438	3, 090	91, 852	12, 640	6, 877	14, 104	5, 633
Oct. 1	166, 380	12, 810	8, 709	2, 310	2, 769	90, 992	12, 407	6, 376	13, 771	5, 047
1927										
Jan. 1	114, 680	13, 176	9, 029	2, 282	3, 392	90, 494	11, 699	6, 322	13, 653	5, 266
Apr. 1	81, 869	11, 923	9, 851	2, 140	3, 409	90, 805	12, 486	6, 095	13, 858	5, 045
July 1	177, 315	9, 111	7, 914	2, 864	3, 186	96, 091	12, 709	5, 758	14, 641	4, 479
Oct. 1	147, 079	9, 390	5, 075	1, 677	2, 846	103, 886	12, 937	6, 170	14, 581	4, 144

Bureau of Agricultural Economics. Compiled from wool stock reports issued quarterly by the Bureau of Agricultural Economics and the Bureau of the Census. Stocks held by the Government are not included.

[1] Not including estimates for firms not reporting nor wool actually reported but for which no grade was stated. Beginning with 1922 estimates for firms not reporting were discontinued. The information in this table is, therefore, not complete as some firms do not report.

TABLE 398.—*Wool: International trade, average 1909–1913, annual 1925–26*

Country	Year ended Dec. 31					
	Average, 1909–1913		1925		1926, preliminary	
	Imports	Exports	Imports	Exports	Imports	Exports
PRINCIPAL EXPORTING COUNTRIES	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Algeria	2,445	19,871	2,967	21,811	4,387	29,279
Argentina	214	328,204	194	249,777	[1] 208	313,674
Australia	324	676,679	[1] 1,784	[1] 671,062	[1] 3,589	[1] 785,774
Brazil	[2] 511	[3] 2,959	971	6,610	[1] 214	15,886
British India	23,721	56,496	[4] 22,399	[5] 49,775	25,577	[5] 40,375
Chile	1,247	28,223	----------	27,239	----------	24,695
China	----------	42,685	859	65,348	725	33,040
Greece	281	294	[1] 2,123	[1] 602	----------	----------
Hungary	----------	----------	1,174	14,714	1,529	13,460
Irish Free State	----------	----------	1,331	10,051	1,529	11,610
Morocco	----------	8,607	----------	13,245	----------	[1] 18,635
New Zealand	168	194,801	116	205,727	201	213,153
Persia	[6] 2,753	10,023	1,998	12,243	----------	----------
Peru	[6] 3	9,333	----------	10,563	----------	9,172
Spain	2,446	28,505	2,795	6,518	5,054	6,707
Union of South Africa	7	164,635	156	220,176	514	222,836
Uruguay	----------	139,178	----------	89,442	----------	[1] 118,762
PRINCIPAL IMPORTING COUNTRIES						
Austria	----------	----------	14,118	1,513	14,348	1,084
Austria-Hungary	63,942	9,622	----------	----------	----------	----------
Belgium	300,367	196,440	99,788	24,122	115,697	22,664
Bulgaria	[3] 1,485	[3] 117	2,961	0	1,859	----------
Canada	7,794	1,323	13,561	6,351	15,378	4,389
Czechoslovakia	----------	----------	[7] 62,427	7,648	30,304	4,034
Denmark	2,337	1,124	1,707	286	2,164	306
Finland	1,794	30	1,748	[1] 56	2,611	----------
France	601,628	84,973	539,872	36,297	638,473	46,263
Germany	481,988	42,817	299,253	19,285	326,123	16,933
Italy	30,145	3,933	76,999	5,307	102,760	8,102
Japan	17,921	----------	82,329	----------	81,917	----------
Netherlands	31,991	26,362	8,274	1,819	9,903	2,745
Norway	3,644	123	1,913	368	1,761	331
Poland	----------	----------	23,939	2,219	25,828	1,349
Rumania	2,473	3,538	970	638	[1] 2,250	[1] 726
Russia	106,184	32,406	[1] 41,277	[1] 12,069	[1] 47,553	[1] 4,008
Sweden	7,267	149	8,251	158	9,870	[1] 86
Switzerland	11,211	338	14,867	59	18,237	40
United Kingdom	506,155	41,164	414,172	53,775	495,673	[1] 54,394
United States	203,298	[8] 46	339,254	273	310,265	292
Yugoslavia	----------	----------	[9] 10,485	[1] 29	[9] 9,547	[1] 84
Total, 39 countries	2,415,744	2,154,998	2,097,031	1,847,175	2,306,012	2,024,888

Bureau of Agricultural Economics. Official sources except where otherwise noted. "Wool" in this table includes: Washed, unwashed, scoured, pulled wool, slipe, and all other animal fibers included in the United States classification of wool. The following items have been considered as not within this classification: Carded, combed, dyed wool, flocks; sheep, lamb, and goat skins with hair on, mill waste, noils, and tops.

[1] International Yearbook of Agricultural Statistics.
[2] Year beginning July 1.
[3] 4-year average.
[4] Included 9 months land trade.
[5] Sea trade only.
[6] 3-year average.
[7] Includes combed, etc.
[8] One year only.
[9] United States Consular Report No. 243140, Mar. 28, 1927.

TABLE 399.—*Wool: Quantities used in manufactures in United States, by classes, 1918–1927* [1]

Year	Combing			Clothing			Carpet			Total		
	Domestic	Foreign	Total	Domestic	Foreign	Total	Foreign combing	Foreign filling	Total	Domestic	Foreign	Total
	1,000 lbs.	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
GREASE												
Average: 1921–1925	153, 843	108, 108	261, 950	19, 094	6, 329	25, 423	52, 977	52, 851	105, 828	172, 937	220, 264	393, 201
1918	164, 878	217, 571	382, 449	17, 845	17, 350	35, 195	16, 414	15, 703	32, 117	182, 723	267, 038	449, 761
1919	182, 936	172, 346	355, 282	20, 995	11, 869	32, 864	24, 672	28, 747	53, 419	203, 931	237, 634	441, 565
1920	134, 824	172, 546	307, 370	17, 914	11, 997	29, 911	28, 356	28, 364	56, 720	152, 738	241, 263	394, 001
1921	159, 340	117, 704	277, 044	20, 243	11, 134	31, 377	22, 968	27, 291	50, 259	179, 583	179, 097	358, 680
1922	210, 142	87, 061	297, 203	26, 750	8, 344	35, 094	58, 797	51, 664	110, 461	236, 892	205, 866	442, 758
1923	111, 494	169, 540	281, 034	17, 487	7, 072	24, 559	72, 231	63, 215	135, 446	128, 981	312, 058	441, 039
1924	152, 960	81, 635	234, 595	15, 483	3, 508	18, 991	54, 042	60, 047	114, 089	168, 443	199, 232	367, 675
1925	135, 278	84, 598	219, 876	15, 506	1, 586	17, 092	56, 848	62, 037	118, 885	150, 784	205, 069	355, 853
1926	126, 559	99, 746	226, 305	15, 750	1, 631	17, 381	45, 605	56, 205	101, 810	142, 309	203, 187	345, 496
1927	173, 095	76, 061	249, 156	16, 935	1, 664	18, 599	44, 755	70, 516	115, 271	190, 030	192, 996	383, 026
SCOURED												
Average: 1921–1925	6, 939	3, 335	10, 274	41, 224	17, 630	58, 854	860	4, 137	4, 997	48, 163	25, 962	74, 125
1918	11, 033	16, 623	27, 656	30, 466	64, 846	95, 312	1, 177	2, 777	3, 954	41, 499	85, 423	126, 922
1919	5, 767	4, 520	10, 287	30, 902	28, 662	59, 564	1, 279	4, 407	5, 686	36, 669	38, 868	75, 537
1920	5, 906	5, 492	11, 398	30, 263	22, 828	53, 091	1, 359	5, 643	7, 002	36, 169	35, 322	71, 491
1921	7, 074	3, 040	10, 114	34, 630	18, 236	52, 866	630	4, 147	4, 777	41, 704	26, 053	67, 757
1922	8, 374	2, 753	11, 127	47, 547	19, 347	66, 894	1, 285	5, 410	6, 695	55, 921	28, 795	84, 716
1923	7, 051	3, 774	10, 825	42, 506	21, 909	64, 415	1, 010	4, 914	5, 924	49, 557	31, 607	81, 164
1924	5, 804	3, 409	9, 213	40, 718	16, 089	56, 807	533	3, 122	3, 655	46, 522	23, 153	69, 675
1925	6, 393	3, 698	10, 091	40, 720	12, 568	53, 288	843	3, 091	3, 934	47, 113	20, 200	67, 313
1926	5, 191	3, 647	8, 838	37, 432	10, 512	47, 944	558	3, 745	4, 303	42, 623	18, 462	61, 085
1927	4, 712	3, 235	7, 947	43, 352	8, 376	51, 728	671	4, 223	4, 894	48, 064	16, 505	64, 569
PULLED												
Average: 1921–1925	7, 825	1, 285	9, 110	9, 552	1, 350	10, 902	1, 940	4, 570	6, 510	17, 376	9, 146	26, 522
1918	9, 977	2, 685	12, 662	8, 497	2, 918	11, 415	179	1, 277	1, 456	18, 474	7, 059	25, 533
1919	9, 707	537	10, 244	8, 809	944	9, 753	321	2, 224	2, 545	18, 516	4, 026	22, 542
1920	7, 514	675	8, 189	6, 116	714	6, 830	420	2, 499	2, 919	13, 630	4, 308	17, 938
1921	9, 445	1, 125	10, 570	11, 024	1, 052	12, 076	1, 149	2, 680	3, 829	20, 469	6, 006	26, 475
1922	9, 609	960	10, 569	9, 840	1, 485	11, 325	2, 264	3, 415	5, 679	19, 449	8, 124	27, 573
1923	8, 052	1, 923	9, 975	8, 315	2, 080	10, 395	2, 884	5, 409	8, 293	16, 367	12, 296	28, 663
1924	5, 852	691	6, 543	9, 508	1, 240	10, 748	1, 052	4, 707	5, 759	15, 360	7, 690	23, 050
1925	6, 165	1, 728	7, 893	9, 071	895	9, 966	2, 351	6, 640	8, 991	15, 236	11, 614	26, 850
1926	7, 389	2, 452	9, 841	8, 341	678	9, 019	3, 752	9, 163	12, 915	15, 730	16, 045	31, 775
1927	9, 006	1, 186	10, 192	10, 004	574	10, 578	1, 904	6, 849	8, 753	19, 010	10, 513	29, 523

Compiled from wool-consumption reports issued monthly by the Bureau of Agricultural Economics, January, 1918–April, 1922; and by the Bureau of the Census, May, 1922–December, 1927.

[1] Not including estimates for firms not reporting nor wool actually reported but for which no grade was stated. Beginning with May, 1922, estimates for firms not reporting were discontinued. The information in this table is, therefore, not complete as some firms do not report.

TABLE 400.—*Wool: Estimated production in grease, average 1909–1913, annual 1923–1927*

Country	Average, 1909–1913	1923	1924	1925	1926	1927 [1]
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
United States:						
Fleece	272,248	225,696	235,575	245,562	260,976	278,037
Pulled	41,400	42,500	43,800	46,800	49,600	50,100
Total	313,648	268,196	279,375	292,362	310,576	328,137
Canada	13,188	15,539	15,112	15,553	17,960	18,673
United Kingdom	136,021	101,965	104,668	109,853	114,567	118,537
France	81,600	43,210	44,092	44,974	46,517	[2] 47,447
Argentina	332,321	341,713	324,000	327,000	344,000	[3] 322,000
Uruguay	133,101	100,000	97,000	116,000	124,000	[4] 129,000
Australia	727,709	661,128	773,984	840,460	892,367	[3] 790,000
New Zealand	179,942	208,979	208,269	200,205	202,386	[2] 208,457
Union of South Africa	157,690	187,290	185,200	220,000	240,000	[3] 240,000
Total above countries	2,075,220	1,928,020	2,031,700	2,166,407	2,292,373	2,202,251
World production, estimates of U. S. Department of Commerce	3,248,477	2,719,453	2,836,539	2,982,561	3,060,730	----------
World production, estimates of National Association of Wool Manufacturers	2,905,850	2,720,840	2,720,070	2,826,498	3,022,289	----------

Bureau of Agricultural Economics. For complete reference to original sources see Foreign Crops and Markets, Dec. 27, 1927, pp. 58-59. Includes clip sheared in spring in Northern Hemisphere and that sheared mostly in last few months of calendar year in Southern Hemisphere.

[1] Preliminary.
[2] Estimate based on increase in sheep figures at the beginning or in the summer of 1927.
[3] Estimate from the International Institute of Agriculture, Rome.
[4] Estimate from Consul Carrigan, Nov. 18, 1927.

TABLE 401.—*Wool (unwashed): Estimated price per pound, received by producers United States, 1910–1927*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Weighted av.
Average:	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1910–1913	19.2	19.2	19.2	18.2	17.9	17.3	17.3	17.5	17.0	16.9	16.9	17.0	17.6
1914–1920	36.6	36.2	37.8	37.2	38.2	38.2	37.8	37.7	37.4	37.2	36.9	37.2	37.6
1921–1925	30.5	31.6	32.5	32.2	32.2	32.3	32.0	31.1	31.5	31.9	32.6	34.0	32.1
1910	24.5	24.6	24.9	22.3	22.8	19.5	19.0	19.5	17.7	18.1	17.9	17.8	20.5
1911	17.3	17.3	16.8	15.7	14.7	15.5	15.4	16.0	15.6	15.5	15.6	15.5	15.6
1912	16.2	16.3	16.9	17.3	17.8	18.7	18.9	18.8	18.7	18.5	18.6	18.6	18.1
1913	18.6	18.7	18.4	17.7	16.3	15.6	15.9	15.8	15.8	15.5	15.6	16.1	16.4
1914	15.7	15.7	16.4	16.8	17.2	18.4	18.5	18.7	18.6	18.0	18.1	18.6	17.7
1915	18.6	20.2	22.8	22.7	22.0	23.7	24.2	23.8	23.3	22.7	22.7	23.3	22.8
1916	23.3	24.2	25.9	26.3	28.0	28.7	28.6	29.0	28.4	28.7	29.4	30.8	27.9
1917	31.8	32.7	36.7	38.8	43.7	49.8	54.3	54.8	54.2	55.5	55.9	58.2	47.8
1918	58.1	57.1	60.0	60.0	58.2	57.4	57.5	57.4	57.7	57.7	56.4	56.2	57.9
1919	55.2	51.1	51.3	47.9	48.0	50.5	51.8	52.2	51.3	50.6	51.0	51.6	50.3
1920	53.3	52.5	51.5	51.3	50.3	38.6	29.5	28.3	28.0	27.5	24.9	21.9	39.1
1921	19.6	19.8	18.9	17.9	16.0	15.4	15.5	15.4	15.5	15.8	15.6	16.9	16.4
1922	18.0	22.3	25.0	24.8	29.0	32.8	32.5	31.6	31.6	32.2	33.2	35.3	29.8
1923	35.3	35.3	37.3	39.2	41.7	41.5	38.3	37.0	37.1	36.9	36.4	36.2	38.9
1924	36.6	37.5	38.2	38.4	37.4	36.0	34.3	33.5	35.5	37.3	40.1	42.2	36.9
1925	42.8	43.2	43.0	40.8	36.9	35.7	39.4	38.1	37.8	37.2	37.8	39.5	38.5
1926	38.9	37.7	34.7	33.2	32.0	31.4	31.9	31.9	32.6	31.6	31.6	30.1	32.5
1927	30.9	31.1	31.3	30.4	30.1	30.2	30.7	31.2	31.2	30.9	31.1	32.0	30.7

Bureau of Agricultural Economics. Based on returns from special price reporters.

TABLE 402.—*Wool, scoured basis, territory, grades 64s, 70s, 80s (fine strictly combing): Average price per pound, Boston market, 1910–1927*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1910	74	73	71	68	63	61	61	62	62	63	63	63	65
1911	61	59	54	53	52	52	55	56	59	60	61	61	57
1912	61	61	61	61	61	61	63	68	68	68	67	67	64
1913	66	64	59	56	55	54	54	54	54	53	53	52	56
1914	52	56	57	59	60	61	61	63	61	59	61	61	59
1915	63	73	73	71	69	71	71	71	71	71	71	73	71
1916	74	77	77	79	79	81	82	85	89	89	97	105	84
1917	113	123	128	133	138	174	174	178	181	180	180	180	157
1918	180	180	183	185	180	180	185	180	180	185	180	180	182
1919	160	152	158	165	165	175	185	185	185	200	200	200	178
1920 [1]	200	205	205	200	200	175	160	145	130	120	95	90	160
1921	84	90	89	88	86	82	82	82	82	82	84	88	85
1922	97	110	110	109	127	134	135	131	130	134	139	140	125
1923	143	144	144	149	153	150	144	137	132	130	130	134	141
1924	139	139	142	138	135	129	130	137	142	147	154	164	141
1925	168	164	153	138	126	130	137	132	129	128	131	131	139
1926	127	124	118	116	112	110	116	116	116	116	114	110	116
1927	110	110	110	109	108	108	111	111	111	112	112	112	110

Bureau of Agricultural Economics. 1910–1920 prices from quarterly reports of the National Association of Wool Manufacturers. 1921–1923 average of weekly range quotations from the Boston Commercial Bulletin and 1924–1927 from the livestock and meat reporting service of the bureau.

[1] Prices June–December, 1920, largely nominal.

TABLE 403.—*Wool, scoured basis, territory, grade 56s (3/8 blood strictly combing): Average price per pound, Boston market, 1910–1927*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1910	69	61	60	57	56	56	56	57	57	56	54	53	58
1911	54	54	52	49	49	50	50	52	52	48	46	48	50
1912	51	52	51	51	51	52	58	58	58	58	58	58	55
1913	58	58	55	50	49	48	48	48	48	47	46	45	50
1914	43	47	47	47	50	52	52	49	48	49	51	53	49
1915	56	63	66	66	66	66	66	68	68	68	67	69	66
1916	70	71	71	71	72	74	76	78	79	80	87	90	77
1917	91	100	102	110	118	132	132	138	146	148	148	148	126
1918	148	149	152	152	142	142	(1)	(1)	(1)	(1)	(1)	(1)	------
1919	126	121	121	110	118	120	128	137	138	127	130	135	126
1920	135	135	131	130	125	112	99	95	88	74	65	56	104
1921	53	55	55	54	53	50	51	52	52	52	54	58	53
1922	63	76	77	74	83	88	88	90	92	95	99	98	85
1923	100	103	105	107	111	111	109	105	103	101	104	108	106
1924	113	116	116	113	109	97	100	109	113	117	122	133	113
1925	136	136	125	109	96	99	105	101	102	102	108	109	111
1926	103	99	93	91	89	89	90	90	91	93	93	91	92
1927	90	90	90	90	88	88	90	91	91	94	94	94	91

Bureau of Agricultural Economics. 1910–1923 compiled from weekly quotations in the Boston Commerical Bulletin. 1924–1927 from the livestock and meat reporting service of the bureau.

[1] No quotations. Prices fixed by Government.

TABLE 404.—*Wool, grease basis, Ohio and similar, grade 56s (3/8 blood strictly combing): Average price per pound, Boston market, 1900–1927*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1900	29	28	27	27	26	25	25	24	24	24	23	24	26
1901	24	23	23	23	22	20	20	20	21	21	21	22	22
1902	22	22	22	22	22	22	22	22	22	23	23	24	22
1903	25	25	25	23	23	24	24	24	26	26	26	26	25
1904	25	26	26	26	26	28	28	28	29	29	31	32	28
1905	32	31	30	31	35	36	36	35	35	35	35	34	34
1906	34	33	33	33	33	33	33	33	33	34	34	34	33
1907	34	34	34	33	32	32	32	33	33	33	31	30	33
1908	31	31	30	29	25	26	25	25	26	26	27	28	27
1909	29	30	31	33	34	35	36	36	37	37	37	37	34
1910	36	36	36	34	31	28	28	28	28	29	30	30	31
1911	30	29	28	25	25	25	25	25	25	25	25	25	26
1912	27	30	29	28	27	29	30	30	30	30	30	30	29
1913	31	31	30	26	24	24	24	24	24	24	23	24	26
1914	24	24	24	25	26	28	28	28	28	28	29	30	27
1915	31	35	37	37	36	36	38	38	37	36	37	38	36
1916	38	40	40	40	40	41	42	42	42	43	45	48	42
1917	49	54	56	59	63	70	74	75	76	76	76	77	67
1918	78	77	78	78	76	76	(1)	(1)	(1)	(1)	(1)	(1)	------
1919	70	65	65	61	61	63	70	71	70	68	69	70	67
1920	70	70	70	69	66	57	52	49	45	40	37	30	55
1921	29	30	30	30	29	26	26	26	26	26	28	32	28
1922	36	39	40	38	42	47	46	46	47	49	53	54	45
1923	55	56	56	56	56	57	56	54	53	52	53	54	55
1924	55	56	57	55	53	49	48	53	55	59	63	69	56
1925	70	69	66	55	46	49	53	52	50	52	54	54	56
1926	54	53	49	46	44	43	44	44	44	45	46	45	46
1927	45	45	45	44	42	42	43	44	45	46	47	48	45

Bureau of Agricultural Economics. 1900–1909 from quarterly reports of the National Association of Wool Manufacturers on Ohio, Pennsylvania, and West Virginia 3/8 blood, 1910–1923 from Boston Commercial Bulletin, average of weekly range on Ohio and Pennsylvania 3/8 blood, and 1924–1927 from the livestock and meat reporting service of the bureau.

[1] No quotations.

TABLE 405.—*Wool (Australian scoured): Average monthly price per pound at London, Queensland superior combing wool, 1921–1927*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1921	-------	-------	-------	-------	-------	-------	-------	51.75	52.75	58.73	60.69	58.87	-------
1922	66.90	74.07	73.38	74.65	79.19	79.76	79.66	79.98	83.81	88.30	93.33	99.87	81.08
1923	101.82	102.61	100.18	99.06	102.20	101.92	103.13	102.61	107.49	107.44	102.26	103.36	102.84
1924	102.47	113.53	113.34	117.85	118.11	116.09	116.54	121.39	127.31	129.47	134.40	136.95	120.62
1925	138.26	128.76	122.40	119.38	111.25	111.38	108.32	107.26	107.03	107.75	109.04	104.08	114.58
1926	99.35	88.21	89.23	91.25	91.25	91.25	91.25	91.25	92.78	93.68	91.25	91.25	91.83
1927	91.25	93.27	93.27	93.27	91.25	92.26	92.87	93.27	94.29	95.30	97.33	97.33	93.75

Bureau of Agricultural Economics. Compiled from weekly quotations of the London Economist. Converted at par for 1926 and 1927; other dates converted to cents per pound on the basis of the monthly average rate of exchange as given in Federal Reserve Bulletins.

TABLE 406.—*Livestock slaughter statistics: Source of supply, classification, slaughter costs, weights, and yields, 1923–1927*

CATTLE

Year and month	Source of supply		Sex classification			Average live cost per 100 pounds	Average live weight	Dressed weight as percentage of live weight	By-product yield (on basis of live weight)		
	Stockyards	Other	Bulls and stags	Cows and heifers	Steers				Edible fat [1]	Edible offal	Hides
	Per cent	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Dollars*	*Pounds*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
1923	89.86	10.14	4.04	48.06	47.90	6.82	952.89	54.13	3.84	2.80	6.79
1924	90.77	9.23	4.10	49.42	46.48	6.64	949.64	53.50	3.86	2.85	6.80
1925	90.74	9.26	3.38	51.31	45.31	7.11	954.06	53.06	3.61	2.94	6.77
1926	89.80	10.20	3.39	49.73	46.88	7.32	964.06	53.77	3.89	3.05	6.79
1927	89.90	10.10	3.72	49.27	47.01	8.62	945.99	53.57	3.71	3.03	6.84
January	91.15	8.85	3.45	51.51	45.04	7.54	968.15	53.53	3.86	3.02	6.92
February	89.75	10.25	2.96	47.49	49.55	7.83	965.27	54.31	4.11	3.13	6.93
March	88.92	11.08	3.84	46.01	50.15	8.28	954.89	54.55	4.23	3.08	6.80
April	89.67	10.33	3.54	46.07	50.39	8.68	945.42	54.78	4.14	3.10	6.84
May	89.98	10.02	3.70	39.09	57.21	9.07	940.80	55.25	4.23	3.05	6.82
June	87.42	12.58	4.06	44.29	51.65	8.98	935.83	54.70	4.01	3.04	6.85
July	88.76	11.24	4.39	42.64	52.97	9.05	953.62	54.05	3.75	2.96	6.74
August	90.34	9.66	5.21	44.68	50.11	8.91	945.13	53.60	3.54	2.95	6.81
September	89.72	10.28	3.06	47.37	49.57	8.76	944.69	53.22	3.29	3.05	6.80
October	91.43	8.57	3.94	59.12	36.94	8.48	935.19	51.93	3.12	4.04	6.83
November	90.79	9.21	3.21	61.41	35.38	8.76	930.86	51.41	3.10	2.82	6.89
December	89.97	10.03	3.13	57.83	39.04	9.17	935.54	51.97	3.39	3.10	6.91

CALVES

Year and month	Source of supply		Average live cost per 100 pounds	Average live weight	Dressed weight as percentage of live weight	By-product yield (on basis of live weight)	
	Stockyards	Other				Edible fat [1]	Edible offal
	Per cent	*Per cent*	*Dollars*	*Pounds*	*Per cent*	*Per cent*	*Per cent*
1923	86.24	13.76	7.86	172.82	57.13	0.75	3.57
1924	87.08	12.92	7.67	176.78	57.28	.75	3.61
1925	87.18	12.82	8.66	176.03	57.51	.71	3.68
1926	85.28	14.72	9.82	176.39	58.52	.66	3.66
1927	84.18	15.82	10.58	175.94	57.31	.75	3.78
January	85.42	14.58	10.53	172.34	58.34	.63	3.77
February	85.33	14.67	10.87	165.92	59.76	.80	3.95
March	80.90	19.10	10.60	157.40	60.50	.79	4.20
April	83.97	16.03	10.18	151.24	59.34	.77	3.83
May	82.97	17.03	10.06	162.66	59.06	.73	4.16
June	82.05	17.95	10.46	171.62	58.35	.75	3.85
July	82.64	17.36	10.78	184.30	56.46	.75	3.70
August	85.16	14.84	11.07	200.57	56.33	.72	3.62
September	84.27	15.73	11.09	198.74	57.56	.75	3.48
October	86.47	13.53	10.64	196.88	54.52	.81	3.52
November	85.70	14.30	10.29	184.74	54.95	.78	3.69
December	84.46	15.54	10.42	176.85	55.58	.68	3.70

[1] Unrendered.

TABLE 406.—*Livestock slaughter statistics: Source of supply, classification, slaughter costs, weights, and yields, 1923–1927*—Continued.

SWINE

Year and month	Source of supply		Sex classification			Average live cost per 100 pounds	Average live weight	Dressed weight as percentage of live weight	By-product yield (on basis of live weight)			
	Stockyards	Other	Sows	Barrows	Stags and boars				Lard (rendered)	Edible offal [1]	Trimmings	Inedible grease (unrendered)
	Per ct.	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*	*Dollars*	*Pounds*	*Per cent*	*Per ct.*	*Per ct.*	*Per ct.*	*Per ct.*
1923	76.07	23.93	52.42	46.86	0.72	7.59	225.33	76.72	16.49	2.14	4.53	1.37
1924	77.95	22.05	52.34	46.96	.70	8.04	222.31	75.33	16.45	2.18	4.59	1.35
1925	75.99	24.01	52.73	46.65	.62	11.79	226.50	75.67	15.04	2.49	5.08	1.29
1926	72.85	27.15	51.58	47.78	.64	12.47	235.06	76.42	15.89	2.69	5.50	1.31
1927	67.63	32.37	50.31	49.10	.59	10.06	233.33	76.27	15.36	2.73	5.64	1.22
January	65.47	34.53	43.29	56.31	.40	11.90	226.86	76.79	15.15	2.72	5.50	1.16
February	67.52	32.48	44.18	55.38	.44	11.73	232.29	77.43	15.24	2.75	5.54	1.22
March	64.74	35.26	44.09	55.47	.44	11.31	235.63	77.15	15.57	2.75	5.36	1.30
April	67.08	32.92	46.39	52.96	.65	10.61	235.18	77.28	16.23	2.75	5.34	1.29
May	70.94	29.06	48.99	50.43	.58	9.51	235.42	77.19	16.13	2.54	5.40	1.21
June	68.02	31.98	52.39	46.87	.74	8.96	238.24	77.07	16.44	2.46	5.31	1.25
July	68.83	31.17	59.03	40.19	.78	9.07	251.20	76.02	16.41	2.52	5.57	1.23
August	70.04	29.96	62.21	36.99	.80	9.24	253.81	75.30	15.29	2.63	5.77	1.18
September	69.38	30.62	61.18	38.04	.78	10.60	240.38	75.64	14.78	2.94	6.56	1.29
October	71.75	28.25	54.38	44.90	.72	10.55	225.87	74.42	13.90	3.04	6.83	1.20
November	68.37	31.63	50.67	48.78	.55	9.01	218.32	74.38	13.77	2.97	6.52	1.13
December	62.88	37.12	46.55	52.99	.46	8.37	217.65	75.15	14.69	2.88	5.28	1.20

SHEEP AND LAMBS

Year and month	Source of supply		Age classification		Average live cost per 100 pounds	Average live weight	Dressed weight as percentage of live weight	By-product yield (on basis of live weight)	
	Stockyards	Other	Sheep	Lambs and yearlings				Edible fat [1]	Edible offal
	Per cent	*Per cent*	*Per cent*	*Per cent*	*Dollars*	*Pounds*	*Per cent*	*Per cent*	*Per cent*
1923	85.97	14.03	13.16	86.84	12.03	80.80	48.07	2.85	1.94
1924	83.60	16.40	10.66	89.34	12.77	80.14	47.53	2.76	1.95
1925	82.44	17.56	10.30	89.70	14.22	81.58	47.82	2.74	2.24
1926	84.64	15.36	9.62	90.38	12.86	81.34	47.62	2.68	2.35
1927	85.42	14.58	8.91	91.09	12.97	81.66	47.74	2.64	2.44
January	81.22	18.78	5.68	94.32	12.05	84.58	46.89	3.01	2.49
February	85.55	14.45	6.19	93.81	12.80	86.30	46.74	2.97	2.38
March	79.63	20.37	11.75	88.25	14.17	86.72	46.71	3.02	2.36
April	83.24	16.76	10.98	89.02	14.63	82.55	47.44	2.85	2.31
May	84.87	15.13	10.85	89.15	14.14	78.36	48.61	2.83	2.48
June	84.39	15.61	10.59	89.41	13.71	75.33	49.13	2.24	2.52
July	86.74	13.26	6.45	93.55	12.90	76.89	48.34	2.42	2.47
August	88.20	11.80	12.35	87.65	12.73	79.26	48.51	2.32	2.40
September	87.31	12.69	9.48	90.52	12.17	79.89	47.99	2.39	2.47
October	86.86	13.14	7.89	92.11	12.24	80.73	48.01	2.38	2.45
November	87.55	12.45	8.27	91.73	12.37	83.42	47.52	2.52	2.52
December	88.48	11.52	7.55	92.45	12.39	86.25	47.39	2.60	2.45

Bureau of Agricultural Economics. Compiled from monthly reports to the bureau from about 750 packers and slaughterers, whose slaughterings equaled nearly 85 per cent of total slaughter under Federal inspection.

[1] Unrendered.

TABLE 407.—*Livestock: Number of animals slaughtered at Federal-inspected plants, 1907–1927*

Year ended June 30—	Cattle	Calves	Sheep	Goats	Swine	Horses	Total
1907	7, 621, 717	1, 763, 574	9, 681, 876	52, 149	31, 815, 900	----------	50, 935, 216
1908	7, 116, 275	1, 995, 487	9, 702, 545	45, 953	35, 113, 077	----------	53, 973, 337
1909	7, 325, 337	2, 046, 711	10, 802, 903	69, 193	35, 427, 931	----------	55, 672, 075
1910	7, 962, 189	2, 295, 099	11, 149, 937	115, 811	27, 656, 021	----------	49, 179, 057
1911	7, 781, 030	2, 219, 908	13, 005, 502	54, 145	29, 916, 363	----------	52, 976, 948
1912	7, 532, 005	2, 242, 929	14, 208, 724	63, 983	34, 966, 378	----------	59, 014, 019
1913	7, 155, 839	2, 098, 484	14, 724, 465	56, 556	32, 287, 538	----------	56, 322, 882
1914	6, 724, 117	1, 814, 904	14, 958, 834	121, 827	33, 289, 705	----------	56, 909, 387
1915	6, 964, 502	1, 735, 902	12, 909, 089	165, 533	36, 247, 858	----------	58, 022, 884
1916	7, 404, 288	2, 048, 022	11, 985, 926	180, 356	40, 482, 799	----------	62, 101, 391
1917	9, 299, 489	2, 679, 745	11, 343, 418	174, 649	40, 210, 847	----------	63, 708, 148
1918	10, 938, 287	3, 323, 077	8, 769, 498	149, 503	35, 449, 247	----------	58, 629, 612
1919	11, 241, 991	3, 674, 227	11, 268, 370	125, 660	44, 398, 389	----------	70, 708, 637
1920	9, 709, 819	4, 227, 558	12, 334, 827	77, 270	38, 981, 914	1, 089	65, 332, 477
1921	8, 179, 572	3, 896, 207	12, 452, 435	20, 027	37, 702, 866	1, 335	62, 252, 442
1922	7, 871, 457	3, 924, 255	11, 968, 434	13, 758	39, 416, 439	1, 898	63, 196, 241
1923	9, 029, 536	4, 337, 780	11, 403, 703	25, 129	48, 600, 069	1, 459	73, 397, 676
1924	9, 188, 652	4, 667, 948	11, 505, 001	31, 279	54, 416, 481	4, 699	79, 814, 060
1925	9, 773, 883	5, 185, 316	12, 203, 159	26, 570	48, 459, 608	11, 909	75, 660, 445
1926	10, 098, 121	5, 311, 774	12, 354, 225	42, 774	40, 442, 730	39, 668	68, 289, 292
1927	10, 049, 589	5, 080, 062	12, 894, 016	30, 437	42, 650, 443	42, 635	70, 747, 182

Bureau of Animal Industry.

TABLE 408.—*Meats and lard: Quantity apparently available for consumption, 1900–1927*

Calendar year	Apparently available for consumption								Percentage of total apparently available for consumption					
	Beef	Veal	Total beef and veal	Lamb and mutton	Pork	Total meats[1]	Lard	Total meats and lard	Beef	Veal	Total beef and veal	Lamb and mutton	Pork	Total meats
	Million lbs.	*Million lbs.*	*Million lbs.*	*Million lbs.*	*Million lbs.*	*Million lbs.*	*Million lbs.*	*Million lbs.*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Average:														
1900–1908	5, 969	423	6, 392	552	5, 109	12, 053	1, 012	13, 065	49. 4	3. 5	52. 9	4. 7	42. 4	100
1909–1913	6, 279	589	6, 868	685	5, 744	13, 297	1, 065	14, 362	47. 2	4. 4	51. 6	5. 2	43. 2	100
1914–1920	6, 081	636	6, 719	588	5, 854	13, 159	1, 303	14, 462	46. 2	4. 8	51. 0	4. 5	44. 5	100
1921–1925	6, 765	724	7, 489	589	7, 754	15, 832	1, 552	17, 384	42. 7	4. 6	47. 3	3. 7	49. 0	100
1900	5, 165	265	5, 430	516	4, 927	10, 873	1, 002	11, 875	47. 5	2. 5	50. 0	4. 7	45. 3	100
1901	5, 362	305	5, 667	538	4, 896	11, 101	1, 002	12, 103	48. 3	2. 8	51. 1	4. 8	44. 1	100
1902	5, 434	346	5, 780	557	4, 584	10, 921	932	11, 853	49. 9	3. 2	53. 1	5. 1	41. 8	100
1903	6, 156	384	6, 540	579	4, 801	11, 920	955	12, 875	51. 6	3. 2	54. 8	4. 9	40. 3	100
1904	6, 081	425	6, 506	563	5, 185	12, 254	1, 025	13, 279	49. 6	3. 5	53. 1	4. 6	42. 3	100
1905	6, 144	455	6, 599	544	4, 950	12, 093	843	12, 936	50. 8	3. 8	54. 6	4. 5	40. 9	100
1906	6, 235	464	6, 699	554	5, 128	12, 381	959	13, 340	50. 4	3. 7	54. 1	4. 5	41. 4	100
1907	6, 779	589	7, 368	558	5, 628	13, 554	1, 183	14, 737	50. 0	4. 3	54. 3	4. 2	41. 5	100
1908	6, 367	573	6, 940	557	5, 884	13, 381	1, 203	14, 584	47. 6	4. 3	51. 9	4. 1	44. 0	100
1909	6, 835	628	7, 463	601	5, 455	13, 519	1, 042	14, 561	50. 6	4. 6	55. 2	4. 4	40. 4	100
1910	6, 561	632	7, 193	596	5, 267	13, 056	1, 052	14, 108	50. 3	4. 8	55. 1	4. 5	40. 4	100
1911	6, 342	597	6, 939	729	6, 046	13, 714	1, 063	14, 777	46. 2	4. 4	50. 6	5. 3	44. 1	100
1912	5, 807	598	6, 405	773	5, 873	13, 051	1, 068	14, 119	44. 5	4. 6	49. 1	5. 9	45. 0	100
1913	5, 852	491	6, 343	725	6, 077	13, 145	1, 100	14, 245	44. 5	3. 7	48. 2	5. 5	46. 3	100
1914	5, 722	448	6, 170	724	6, 102	12, 996	1, 192	14, 188	44. 0	3. 4	47. 4	5. 6	47. 0	100
1915	5, 414	428	5, 842	622	5, 908	12, 372	1, 281	13, 653	43. 8	3. 4	47. 2	5. 0	47. 8	100
1916	5, 639	536	6, 175	613	6, 055	12, 843	1, 368	14, 211	43. 9	4. 2	8. 1	4. 8	47. 1	100
1917	6, 083	662	6, 745	473	5, 037	12, 255	1, 195	13, 450	49. 6	5. 4	55. 0	3. 9	41. 1	100
1918	6, 522	765	7, 287	486	5, 684	13, 457	1, 374	14, 831	48. 5	5. 7	54. 2	3. 6	42. 2	100
1919	6, 474	808	7, 282	607	5, 755	13, 644	1, 292	14, 936	47. 5	5. 9	53. 4	4. 4	42. 2	100
1920	6, 713	805	7, 518	590	6, 437	14, 545	1, 416	15, 961	46. 2	5. 5	51. 7	4. 0	44. 3	100
1921	6, 171	751	6, 922	639	6, 886	14, 447	1, 223	15, 670	42. 7	5. 2	47. 9	4. 4	47. 7	100
1922	6, 643	797	7, 440	545	7, 260	15, 245	1, 558	16, 803	43. 6	5. 2	48. 8	3. 6	47. 6	100
1923	6, 858	865	7, 723	576	8, 338	16, 637	1, 707	18, 344	41. 2	5. 2	46. 4	3. 5	50. 1	100
1924	7, 001	929	7, 930	589	8, 492	17, 011	1, 749	18, 760	41. 1	5. 5	46. 6	3. 4	50. 0	100
1925	7, 175	1, 004	8, 179	597	7, 794	16, 570	1, 522	18, 092	43. 4	6. 1	49. 5	3. 6	46. 9	100
1926	7, 454	964	8, 418	641	7, 689	16, 748	1, 584	18, 332	44. 4	5. 8	50. 2	3. 8	46. 0	100
1927	6, 926	874	7, 800	645	8, 122	16, 567	1, 634	18, 201	41. 7	5. 3	47. 0	3. 9	49. 1	100

Bureau of Animal Industry. Quantities in this table are based on carcass weights at slaughter, which do not include the edible offal.

[1] Not including goat meat.

TABLE 409.—*Meats and lard: Quantity apparently available for consumption, per capita, per annum, 1900–1927*

Calendar year	Beef	Veal	Lamb and mutton	Park, not including lard	Total meats [1]	Lard	Total meats and lard
	Pounds	*Pounds*	*Pounds*	*Pounds*	*Pounds*	*Pounds*	*Pounds*
Average:							
1900–1908	72.2	5.1	6.7	61.8	145.8	12.2	158.0
1909–1913	67.2	6.3	7.3	61.3	142.1	11.4	153.5
1914–1920	59.4	6.2	5.8	57.3	128.7	12.8	141.5
1921–1925	60.4	7.8	5.3	69.3	142.8	13.9	156.7
1900	67.8	3.5	6.8	64.7	142.8	13.2	156.0
1901	69.0	3.9	6.9	63.0	142.8	12.9	155.7
1902	68.5	4.4	7.0	57.8	137.7	11.7	149.4
1903	76.0	4.7	7.2	59.3	147.2	11.8	159.0
1904	73.6	5.1	6.8	62.8	148.3	12.4	160.7
1905	73.0	5.4	6.5	58.8	143.7	10.0	153.7
1906	72.6	5.4	6.5	59.7	144.2	11.2	155.4
1907	77.5	6.7	6.4	64.6	155.0	13.5	168.5
1908	71.5	6.4	6.3	66.1	150.3	13.5	163.8
1909	75.4	6.9	6.6	60.1	149.0	11.5	160.5
1910	71.1	6.8	6.4	57.1	141.4	11.4	152.8
1911	67.7	6.4	7.8	64.5	146.4	11.3	157.7
1912	61.1	6.3	8.1	61.8	137.3	11.2	148.5
1913	60.6	5.1	7.5	63.0	136.2	11.4	147.6
1914	58.5	4.6	7.4	62.3	132.8	12.2	145.0
1915	54.5	4.3	6.3	59.5	124.6	12.9	137.5
1916	56.0	5.3	6.1	60.1	127.5	13.6	141.1
1917	59.5	6.5	4.6	49.3	119.9	11.7	131.6
1918	63.0	7.4	4.7	54.8	129.9	13.3	143.2
1919	61.6	7.7	5.8	54.8	129.9	12.3	142.2
1920	63.1	7.6	5.5	60.5	136.7	13.3	150.0
1921	56.9	7.0	5.9	63.5	133.3	11.3	144.6
1922	60.4	7.3	5.0	66.1	138.8	14.2	153.0
1923	61.4	7.7	5.2	74.7	149.0	15.3	164.3
1924	61.6	8.2	5.2	74.7	149.7	15.4	165.1
1925	62.2	8.7	5.2	67.6	143.7	13.2	156.9
1926	63.6	8.2	5.5	65.7	143.0	13.5	156.5
1927	58.4	7.4	5.4	68.5	139.7	13.8	153.5

Bureau of Animal Industry. Quantities based on carcass weights and do not include the edible offal.

[1] Not including goat meat.

TABLE 410.—*Meat and meat products prepared under Federal inspection, 1907–1927*

Year ended June 30—	Pork placed in cure	Sausage chopped	Canned meats	Lard	Lard compounds and substitutes	Oleo products	Oleomargarine	All other products	Total
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
1907	2,248,886	267,760	105,196	1,003,602	353,549	283,971	55,694	145,554	4,464,213
1908	2,875,907	416,200	92,582	1,433,778	436,448	293,425	79,380	330,487	5,958,298
1909	2,686,051	457,095	123,810	1,308,986	488,249	295,889	91,068	1,340,289	6,791,437
1910	2,216,680	485,864	127,263	948,468	671,526	296,429	139,158	1,338,576	6,223,964
1911	2,568,149	488,814	144,942	1,185,503	672,845	330,688	117,848	1,425,444	6,934,233
1912	2,633,752	523,893	153,871	1,309,140	648,443	297,038	128,319	1,585,103	7,279,559
1913	2,545,358	531,626	115,237	1,222,857	670,802	264,705	145,356	1,598,869	7,094,810
1914	2,568,335	542,017	120,473	1,187,903	590,409	274,625	143,999	1,605,475	7,033,296
1915	2,913,328	502,675	235,963	1,277,734	520,899	273,049	145,931	1,663,491	7,533,070
1916	2,922,381	565,047	164,200	1,277,870	397,089	287,047	152,388	1,708,972	7,474,994
1917	2,918,211	635,860	283,319	1,119,315	466,198	279,197	225,074	1,736,459	7,663,633
1918	3,132,549	624,827	468,633	943,851	453,164	263,630	265,335	1,743,196	7,905,185
1919	3,717,838	667,602	632,259	1,256,043	409,732	266,808	251,170	1,907,590	9,169,042
1920	2,903,854	682,521	211,521	1,316,918	328,567	364,992	217,561	1,749,224	7,755,158
1921	2,501,885	583,777	86,240	1,487,820	339,366	253,397	151,638	1,723,697	7,127,820
1922	2,725,031	568,626	109,481	1,659,331	312,014	268,034	118,197	1,666,402	7,427,116
1923	3,366,258	679,315	160,132	2,017,939	336,843	278,137	129,767	1,920,156	8,888,547
1924	3,502 368	707,323	183,026	2,110,660	363,320	259,008	142,881	2,136,254	9,404,840
1925	3,176,714	736,877	214,330	1,733,933	458,518	287,271	133,836	2,170,598	8,912,077
1926	2,850,622	771,655	214,167	1,598,754	543,913	275,636	148,331	2,008,004	8,411,082
1927	2,920,206	765,074	248,459	1,691,344	535,175	280,641	148,384	1,977,161	8,566,444

Bureau of Animal Industry.

The above figures do not represent production, as a product may be inspected more than once in course of further manufacture.

TABLE 411.—*Meat and meat products: International trade, average 1911–1913, annual 1923–1926*

Country	Average, 1911-1913 Imports	Average, 1911-1913 Exports	1923 Imports	1923 Exports	1924 Imports	1924 Exports	1925 Imports	1925 Exports	1926, preliminary Imports	1926, preliminary Exports
	Year ended Dec. 31									
PRINCIPAL EXPORTING COUNTRIES	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Argentina	3,467	1,173,461	542	1,853,251	529	2,406,974	350	2,168,222	424	2,087,358
Australia	1,967	507,143	[1] 4,278	[1] 468,724	[1] 11,222	[1] 212,406	[1] 5,760	[1] 458,134	[1] 5,506	[1] 422,134
Brazil	54,012	1,520	6,176	250,305	14,438	190,158	23,201	153,040	9,372	30,033
Canada	43,327	60,242	62,393	142,665	33,099	174,258	23,378	206,455	25,247	157,473
Chile	11,738	19,728	1,225	30,078	771	31,810	9,447	42,205		32,144
China	85	64,684	1,411	56,377	2,992	55,095	2,374	55,454	4,560	53,844
Denmark	32,184	368,188	19,239	492,220	18,522	528,423	18,633	564,984	24,642	551,033
Hungary			19,122	21,996	19,585	18,631	5,193	42,835	6,140	62,623
Irish Free State					71,371	117,436	77,524	89,997	73,891	88,199
Netherlands	359,864	497,402	262,927	368,508	281,613	515,244	253,792	553,776	224,127	495,723
New Zealand	960	326,539	832	405,712	1,182	425,445	1,239	449,916	1,064	398,502
Sweden	24,215	39,768	39,797	48,617	40,184	58,122	41,068	36,185	38,009	46,333
Union of South Africa	31,103	401	16,792	2,092	17,455	18,810	16,569	23,264	10,786	37,121
United States	18,719	1,277,524	69,960	2,342,809	62,223	2,063,522	62,943	1,584,468	102,626	1,445,219
Uruguay	[2] 702	196,911		456,041	54	398,341	77	421,280		442,902
Yugoslavia			437	49,279	796	42,467	56	29,407	27	52,688
PRINCIPAL IMPORTING COUNTRIES										
Austria	[3] 49,268	[3] 12,420	165,474	1,160	179,045	2,647	129,560	3,008	120,383	8,245
Belgium	179,120	127,057	266,037	23,428	319,660	34,463	285,793	60,795	212,938	84,091
Cuba	128,362	(4)	205,775		232,838		196,380		179,365	
Czechoslovakia			162,290	2,737	167,170	5,324	114,825	8,627	113,617	9,358
Finland	14,973	2,081	21,866	3,543	20,171	4,810	13,200	8,078	20,021	7,728
France	111,496	98,251	376,947	90,709	498,729	60,108	377,018	55,788	311,478	47,653
Germany	559,752	19,525	768,606	15,988	880,075	28,424	982,581	34,980	937,666	34,937
Italy	104,619	15,708	146,178	17,370	379,483	11,322	318,656	15,591	205,132	35,576
Japan	11,727		70,228		73,520		54,858		74,779	
Norway	42,416	3,365	69,349	2,801	56,018	2,102	52,278	2,284	38,686	3,096
Philippine Islands	21,902		13,424		16,421		17,531	(4)	19,574	
Poland			34,908	4,591	50,783	18,278	32,168	78,780	22,277	79,411
Russia	130,897	53,175	8,053	22	12,289					
Spain	37,974	3,200	23,085	9,533	27,948	11,380	27,203	7,016	26,332	70,952
Switzerland	60,174	3,169	38,432	2,886	34,062	2,617	27,639	3,897	30,010	3,208
United Kingdom	2,843,605	117,226	3,909,650	114,709	3,801,052	143,423	3,878,850	136,718	3,839,985	126,400
Total	4,878,618	4,988,721	6,785,436	7,278,151	7,325,300	7,582,070	7,050,144	7,301,214	6,678,664	6,913,984

tals by kinds of meat:										
Beef	2, 023, 704	2, 161, 464	2, 835, 471	2, 992, 067	3, 147, 141	3, 351, 765	3, 269, 503	3, 458, 616	3, 141, 808	077
Mutton	610, 820	559, 795	700, 112	646, 951	615, 004	558, 688	658, 527	591, 162	655, 326	552
Pork	1, 585. 242	1, 604, 439	2, 661, 230	2, 788, 152	2, 728, 735	2, 743, 576	2, 358, 184	2, 358, 964	2, 202, 792	306
Other	658, 882	663, 023	588, 623	850, 981	834, 420	928, 041	763, 930	892, 472	678, 738	049

Bureau of Agricultural Economics. Official sources.

[1] Year ended June 30. [2] 1 year only. [3] Average for Austria-Hungary. [4] Less than 500 pounds.

TABLE 412.—*Meats, western dressed, fresh, and smoked: Average wholesale price per 100 pounds at Chicago and New York, by months, 1920–1927*

BEEF AND VEAL

Year and month	Chicago					New York				
	Steer beef			Cow beef, good	Veal,[1] good	Steer beef			Cow beef, good	Veal,[1] good
	Choice	Good	Medium			Choice	Good	Medium		
1920	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
January	-------	21.61	17.79	16.88	26.85	-------	21.28	18.63	17.05	26.95
February	-------	19.64	16.59	15.80	26.67	-------	18.58	17.02	15.02	27.88
March	-------	20.05	17.87	16.72	26.05	[2] 21.50	19.64	18.03	16.74	28.20
April	-------	20.63	18.90	17.46	24.23	-------	21.94	20.00	18.90	29.50
May	21.00	19.70	18.50	17.64	20.00	-------	19.00	17.75	16.96	20.78
June	24.38	22.90	21.37	19.42	22.25	-------	24.82	22.22	19.81	22.34
July	26.10	23.69	20.38	19.39	23.18	26.17	24.94	20.81	[2] 21.00	25.54
August	26.76	24.18	19.03	17.98	22.18	26.74	23.78	20.13	-------	23.35
September	28.05	25.02	20.63	17.95	24.20	27.68	23.66	19.88	-------	27.38
October	27.64	23.50	18.48	16.48	22.55	27.61	22.00	17.33	14.72	24.07
November	27.65	23.73	18.66	15.89	21.33	27.00	21.08	17.36	15.50	25.26
December	23.88	20.02	16.38	13.38	16.00	[2] 26.12	18.20	15.50	12.98	18.88
Average	-------	22.06	18.72	17.08	22.96	-------	21.58	18.72	-------	25.01
1921										
January	20.90	18.43	16.38	14.63	18.35	-------	17.36	16.00	14.36	23.63
February	17.33	15.20	13.80	12.33	17.90	-------	14.45	13.36	-------	19.85
March	18.86	17.06	14.62	13.75	18.46	-------	17.08	16.01	14.40	19.74
April	18.10	16.65	14.85	14.39	15.85	18.60	17.04	15.94	14.63	17.75
May	17.25	15.94	14.76	13.95	15.78	16.97	15.64	14.71	13.39	16.30
June	16.64	15.22	14.02	12.95	15.26	16.84	15.56	14.42	12.84	16.34
July	16.56	15.10	13.54	12.85	16.60	16.80	15.25	13.35	12.75	15.95
August	17.17	15.74	12.99	12.36	15.52	18.33	15.85	13.40	12.42	16.88
September	17.13	16.20	13.04	11.64	18.60	17.94	15.34	13.03	11.25	20.85
October	18.31	16.65	13.30	11.86	16.58	18.46	15.05	12.64	10.50	19.18
November	18.34	16.49	13.00	11.50	15.19	18.47	14.34	12.00	9.52	16.40
December	18.08	16.48	13.98	11.50	13.71	18.85	14.92	12.95	11.38	17.98
Average	17.89	16.26	14.02	12.81	16.48	-------	15.66	13.98	-------	18.40
1922										
January	16.55	15.00	13.20	11.50	14.78	-------	14.06	12.76	11.17	19.20
February	14.86	13.68	12.22	10.88	15.50	-------	13.12	11.70	10.55	18.92
March	14.93	14.06	13.04	10.67	15.40	14.47	13.62	12.82	10.98	16.04
April	15.18	14.42	13.39	10.82	14.24	14.35	13.60	12.69	10.75	13.72
May	14.99	14.37	13.50	12.04	15.04	15.03	14.34	13.58	11.59	14.20
June	15.25	14.45	13.56	12.39	14.95	15.50	14.08	12.96	12.18	14.52
July	16.44	15.34	14.11	12.61	15.22	17.18	16.31	14.81	13.13	15.18
August	16.33	15.16	13.94	11.56	16.54	17.52	16.00	12.98	11.60	15.66
September	17.02	16.04	14.28	11.95	17.95	18.65	17.19	14.20	13.50	18.19
October	17.51	16.10	14.49	11.25	16.60	19.48	16.75	12.74	11.17	15.98
November	17.76	16.04	13.43	10.50	15.26	18.73	16.06	12.20	9.80	14.67
December	17.82	16.34	13.69	10.60	14.88	18.95	15.63	13.01	10.65	15.45
Average	16.22	15.08	13.57	11.40	15.53	-------	15.06	13.04	11.42	15.98
1923										
January	17.80	16.27	13.79	11.47	16.98	18.50	15.14	12.50	11.09	17.68
February	17.24	15.70	13.92	11.40	18.20	16.15	14.32	13.02	11.35	20.44
March	16.54	15.21	13.40	11.09	16.55	15.01	13.96	12.61	10.94	17.00
April	16.48	14.79	13.36	11.50	15.25	15.48	14.46	13.44	12.21	15.35
May	16.77	15.34	14.33	12.11	15.67	16.75	15.69	14.58	13.36	16.26
June	17.45	16.22	14.95	12.42	16.35	17.60	16.60	14.66	12.90	15.78
July	17.66	16.59	15.58	12.84	17.82	18.82	17.61	15.88	14.09	18.72
August	18.05	16.80	15.05	12.96	17.50	19.65	17.98	14.66	13.48	18.62
September	18.81	17.62	15.54	13.00	19.05	20.20	18.64	14.92	12.78	20.55
October	18.23	16.76	14.05	12.50	17.16	19.54	17.09	13.44	11.36	19.16
November	18.16	16.62	13.95	11.85	13.36	18.75	15.85	12.78	11.41	14.80
December	19.01	17.62	15.52	12.50	14.75	19.48	16.50	13.88	11.89	15.95
Average	17.68	16.30	14.45	12.14	16.55	17.99	16.15	13.86	12.24	17.53

[1] Hide on. [2] 2-week average in 5-week month.

TABLE 412.—*Meats, western dressed, fresh and smoked: Average wholesale price per 100 pounds at Chicago and New York, by months, 1920–1927*—Continued

Year and month	Chicago							New York						
	Steer beef					Cow beef, good	Veal,[1] good	Steer beef					Cow beef, good	Veal,[1] good
	Choice		Good		Medium			Choice		Good		Medium		
1924	*Dollars*		*Dollars*		*Dolls.*	*Dolls.*	*Dolls.*	*Dollars*		*Dollars*		*Dolls.*	*Dolls.*	*Dolls.*
January	19.02		17.17		14.28	12.11	17.08	19.35		16.68		14.15	11.95	19.98
February	18.50		16.73		14.34	11.75	17.15	17.78		15.90		13.87	12.32	19.62
March	18.50		16.66		14.51	11.81	16.52	18.00		16.06		14.29	12.38	17.02
April	18.50		17.00		15.15	12.30	16.46	18.74		17.15		15.12	13.88	15.86
May	18.38		17.28		15.64	13.00	16.25	18.65		16.94		15.00	14.06	16.25
June	17.84		16.48		15.04	13.64	15.44	17.19		15.60		13.79	13.36	15.62
July	17.33		16.00		14.61	13.92	15.54	16.97		15.39		13.70	12.73	15.94
August	18.11		16.85		14.81	14.02	15.98	18.48		16.19		13.20	13.30	17.58
September	18.02		16.86		14.26	13.16	16.02	18.27		16.42		13.28	12.38	19.28
October	18.24		16.78		14.00	12.58	14.50	19.10		16.26		12.46	11.30	18.38
November	18.10		16.50		13.60	12.25	12.50	18.66		15.92		12.89	10.76	15.70
December	19.10		16.84		13.50	11.85	13.83	19.63		15.82		12.08	10.64	16.90
Average	18.30		16.76		14.48	12.70	15.61	18.40		16.19		13.65	12.43	17.34
1925														
January	18.40		16.35		13.39	12.00	15.65	18.20		14.88		12.28	11.15	18.35
February	17.40		15.70		12.80	12.30	17.55	16.52		14.16		12.38	10.88	19.19
March	17.70		16.52		14.96	13.00	16.45	17.52		15.88		14.21	13.38	17.72
April	17.94		16.50		15.00	13.57	14.18	17.77		16.79		15.69	14.08	16.15
May	17.75		16.40		14.90	13.59	15.02	17.56		16.34		15.31	13.85	17.08
June	17.50		16.20		13.88	13.22	14.70	17.48		16.40		14.71	13.39	15.72
July	19.49		17.47		14.17	13.59	16.36	20.52		18.28		14.50	13.84	18.02
August	20.78		18.05		14.32	13.00	17.85	21.18		17.70		13.55	12.88	18.88
September	21.46		18.75		14.69	13.01	18.50	22.76		19.30		14.82	13.54	20.64
	700 lbs. up	700 lbs. down	700 lbs. up	700 lbs. down			Vealers, good	700 lbs. up	700 lbs. down	700 lbs. up	700 lbs. down			Vealers, good
October	21.96	21.44	19.06	18.08	13.52	12.81	18.10	21.85	22.32	18.45	18.72	14.08	13.12	18.85
November	20.65	20.32	17.65	17.00	12.68	11.35	16.44	19.66	19.99	16.72	16.60	13.15	11.56	17.14
December	19.84	19.84	16.99	16.99	13.23	12.00	17.09	18.95	19.24	17.18	16.54	14.74	13.06	19.92
Average	------	------	------	------	13.96	12.79	------	------	------	------	------	14.12	12.89	------
1926														
January	18.55	18.55	16.28	16.28	13.35	13.40	19.70	17.54	17.71	15.82	15.66	14.15	12.80	21.45
February	18.00	17.55	15.64	15.38	13.19	13.14	19.00	16.85	16.92	14.99	14.99	13.50	12.98	22.04
March	17.00	17.96	15.15	15.85	13.42	13.38	18.40	16.75	16.94	15.33	15.30	14.11	13.15	20.46
April	16.25	17.88	14.75	16.34	14.64	13.88	16.95	17.54	17.98	16.41	16.76	15.62	14.12	18.68
May	15.81	16.75	14.65	15.29	13.91	13.84	19.05	16.55	16.84	15.48	15.56	13.90	13.32	19.05
June	16.14	17.10	15.14	15.74	14.14	13.50	18.51	16.85	17.30	15.91	15.92	14.24	13.73	18.92
July	15.70	16.60	14.56	15.33	13.61	13.18	18.95	16.31	16.72	15.48	15.64	12.73	12.48	19.62
August	15.95	16.81	14.80	15.38	13.56	12.94	20.45	16.50	16.82	15.52	15.56	12.95	12.10	21.30
September	16.98	18.46	16.17	17.03	13.44	13.04	21.12	18.58	19.46	16.65	16.88	13.64	13.00	22.46
October	16.54	18.41	15.65	16.91	13.36	12.50	20.65	18.01	19.18	15.61	15.91	12.66	12.11	21.18
November	16.50	18.28	15.50	16.78	13.89	12.50	17.08	17.90	19.35	15.89	16.35	13.47	12.56	19.80
December	16.50	18.91	15.50	17.15	14.16	13.22	17.36	18.22	19.72	16.44	17.20	14.43	12.79	18.74
Average	16.66	17.77	15.32	16.12	13.72	13.21	18.94	17.30	17.91	15.79	15.98	13.71	12.93	20.31
1927														
January	16.50	19.00	15.50	17.00	14.45	13.72	20.05	17.36	18.76	15.59	15.91	13.44	13.00	20.28
February	16.28	18.78	15.05	16.05	14.05	14.00	20.05	17.44	18.56	15.96	16.21	14.62	13.56	22.36
March	17.91	18.97	16.46	16.89	14.91	14.60	19.68	18.01	18.30	16.59	16.43	15.13	14.09	20.72
April	19.18	19.18	17.60	17.35	15.66	15.38	17.90	19.02	19.06	17.64	17.60	16.35	15.04	18.58
May	19.00	19.09	17.25	17.14	15.35	15.08	17.25	19.00	19.00	17.75	17.75	16.50	15.02	18.35
June	19.14	18.56	17.46	16.84	14.89	14.86	17.78	19.25	19.37	17.84	17.84	16.00	15.87	18.66
July	20.50	19.45	18.90	17.88	16.15	14.69	19.75	20.82	20.84	19.36	19.44	16.80	16.51	21.62
August	20.64	20.25	18.99	18.04	15.78	14.37	22.40	22.09	21.89	19.47	19.51	16.11	15.14	23.80
September	21.38	21.20	19.15	18.40	15.80	14.59	23.35	22.76	22.70	19.79	19.70	15.81	15.08	24.85
October	22.80	22.75	20.08	19.48	15.61	14.65	22.75	23.86	23.86	20.20	19.72	15.80	15.06	22.80
November	23.98	23.84	21.31	19.99	16.28	14.44	18.86	24.75	24.75	21.02	21.02	16.92	15.60	20.22
December	23.35	22.28	20.80	19.28	16.48	15.50	18.62	23.61	23.61	20.51	20.51	17.28	16.30	20.42
Average	20.06	20.28	18.21	17.86	15.45	14.66	19.87	20.66	20.89	18.48	18.47	15.90	15.02	21.06

[1] Hide on.

TABLE 412.—*Meats, western dressed, fresh and smoked: Average wholesale price per 100 pounds at Chicago and New York, by months, 1920–1927*—Continued

PORK CUTS

Year and month	Chicago						New York					
	Fresh pork			Cured pork and lard			Fresh pork			Cured pork and lard		
	Hams, 12–16 lbs.	Loins, 12–14 lbs.	Picnics, 6–8 lbs.	Hams, smoked, 10–12 lbs.	Bacon, breakfast, 6–8 lbs.	Lard, pure (tierces)	Hams	Loins, 12–14 lbs.	Picnics, 6–8 lbs.	Hams, smoked, 10–12 lbs.	Bacon, breakfast	Lard, pure (tierces)
1920	*Dolls.*	*Dolls.*	*Dolls.*	*Dollars*	*Dolls.*	*Dollars*	*Dolls.*	*Dolls.*	*Dolls.*	*Dollars*	*Dolls.*	*Dollars*
Jan.	-------	22.78	18.53	31.02	37.90	-------	-------	22.78	19.18	30.60	37.70	26.73
Feb.	-------	24.03	18.48	32.13	38.25	23.14	-------	22.26	19.11	31.35	38.25	25.40
				14–16 lbs.								
Mar.	-------	26.47	17.96	30.67	34.18	22.93	-------	26.34	19.50	30.94	37.46	22.88
Apr.	-------	30.58	19.26	32.56	36.22	22.71	-------	29.60	22.63	33.68	38.60	22.81
May	-------	25.63	18.17	34.69	39.10	22.75	-------	27.40	20.73	36.13	40.25	22.75
June	-------	24.19	18.97	36.20	39.60	22.98	-------	25.25	19.35	37.10	42.20	22.75
July	-------	29.75	19.70	37.75	38.50	21.71	-------	25.89	19.39	37.00	42.50	21.24
Aug.	-------	31.28	19.75	36.88	37.50	21.16	-------	29.03	19.88	36.55	42.00	20.86
Sept.	-------	35.68	20.90	35.75	37.05	22.58	-------	36.06	21.91	36.54	40.60	22.08
Oct.	-------	33.20	20.75	34.81	36.19	23.28	-------	34.18	21.88	36.68	40.33	23.88
Nov.	-------	24.86	18.71	29.38	32.50	22.07	-------	31.00	20.66	32.25	38.00	23.03
Dec.	-------	17.74	14.34	24.05	27.10	18.15	-------	19.02	15.30	26.42	33.38	18.51
Av.	-------	27.18	18.79	-------	36.17	-------	-------	27.40	19.96	33.77	39.27	22.74
1921												
Jan.	21.75	19.40	13.20	24.25	26.25	16.03	20.90	22.08	14.20	24.63	29.13	14.13
Feb.	23.31	17.23	12.70	25.63	27.81	14.91	23.25	19.06	13.84	28.00	30.25	15.13
Mar.	24.00	22.28	13.14	25.50	27.80	14.48	24.14	21.16	14.26	27.60	30.00	13.90
Apr.	23.51	23.00	11.35	25.38	27.38	13.07	25.30	24.08	13.83	27.68	30.00	13.50
May	23.00	18.18	9.50	25.16	25.69	11.88	24.08	19.90	11.86	25.50	29.50	12.44
June	22.91	17.69	11.95	25.60	25.53	12.03	23.70	19.18	11.82	25.60	28.05	12.45
July	26.58	19.69	13.53	29.44	26.44	13.94	25.12	20.30	11.90	28.50	28.00	13.13
Aug.	24.60	23.26	12.94	29.50	27.30	13.65	26.30	23.12	13.38	31.86	29.56	13.58
Sept.	19.60	21.95	11.33	25.56	24.88	13.51	22.50	23.92	11.86	26.50	27.00	13.88
Oct.	15.25	19.33	10.31	22.19	22.50	12.16	18.50	23.40	12.25	23.00	24.00	12.75
Nov.	15.41	15.11	9.90	21.38	21.80	11.62	17.70	17.38	11.60	22.00	24.00	12.45
Dec.	15.49	16.11	10.76	21.22	20.56	11.25	19.50	17.66	11.99	22.38	24.00	11.25
Av.	21.28	19.44	11.72	25.07	25.33	13.21	22.58	21.01	12.73	26.10	27.79	13.22
1922												
Jan.	17.49	13.92	10.75	21.70	19.89	11.19	21.50	14.61	11.75	21.44	22.00	11.06
Feb.	23.38	14.64	12.06	25.56	22.88	12.59	23.94	16.45	13.30	26.88	23.75	12.69
Mar.	25.00	17.70	13.25	28.80	26.65	13.50	26.90	18.98	15.18	32.95	27.80	13.90
Apr.	25.62	20.35	13.35	28.88	26.56	12.62	25.75	21.65	14.90	33.12	27.00	12.12
May	26.62	19.96	13.41	29.15	26.25	13.15	27.30	21.74	14.50	31.20	28.10	13.23
June	26.50	16.82	13.60	29.12	26.44	13.22	27.62	19.32	14.55	30.38	29.38	13.03
July	24.95	18.79	14.42	28.12	26.56	13.06	25.19	19.54	15.23	31.12	31.75	13.22
Aug.	19.90	19.45	12.93	24.09	26.65	13.30	21.95	20.48	14.92	26.40	30.80	13.18
Sept.	18.06	22.84	11.48	22.19	27.62	13.00	19.75	23.48	-------	21.94	25.38	13.16
Oct.	17.90	21.95	11.82	21.66	29.46	14.12	20.50	22.80	13.43	22.62	29.00	13.62
Nov.	17.27	16.44	11.77	20.40	27.20	13.78	18.30	19.23	13.00	22.00	27.70	13.38
Dec.	17.56	14.00	11.52	19.62	23.88	13.31	19.50	15.28	11.38	20.88	27.75	13.16
Av.	21.69	18.07	12.53	24.94	25.84	13.07	23.18	19.46	-------	26.74	27.53	12.98
1923												
Jan.	18.10	14.26	10.64	19.85	21.85	13.20	20.00	14.80	10.96	20.60	26.00	12.80
Feb.	17.81	13.46	10.72	19.44	21.25	13.25	20.00	14.42	-------	20.88	24.75	12.81
Mar.	18.12	13.46	9.76	19.47	21.88	13.87	18.75	14.35	10.05	20.75	23.00	12.78
Apr.	17.75	13.21	9.22	20.12	22.19	13.42	19.25	14.16	9.50	21.88	23.38	12.69
May	17.50	15.99	8.50	19.68	23.25	13.12	18.50	16.35	9.90	21.30	24.10	12.42
June	17.38	13.38	7.89	19.56	23.88	13.18	18.38	14.54	8.95	21.38	22.25	11.91
July	17.25	15.13	8.75	19.97	24.12	12.84	19.00	16.38	-------	23.38	23.12	12.00
Aug.	18.30	17.30	9.18	21.20	24.55	12.83	19.50	17.81	9.50	24.00	23.50	12.10
Sept.	18.06	21.57	10.22	21.44	24.00	15.06	19.88	23.74	10.65	23.88	24.25	13.20
Oct.	16.75	17.34	9.47	21.31	22.22	15.22	18.50	19.11	10.64	23.20	21.50	13.86
Nov.	15.75	11.56	8.40	20.44	21.15	15.72	17.75	13.64	9.84	22.25	20.75	14.78
Dec.	15.38	10.98	8.34	20.34	18.55	15.04	16.50	13.51	9.52	21.12	20.00	14.94
Av.	17.35	14.80	9.26	20.24	22.41	13.90	18.83	16.07	-------	22.05	23.05	13.02

TABLE 412.—*Meats, western dressed, fresh and smoked: Average wholesale price per 100 pounds at Chicago and New York, by months, 1920–1927*—Continued

PORK CUTS—Continued

Year and month	Chicago						New York					
	Fresh pork			Cured pork and lard			Fresh pork			Cured pork and lard		
	Hams, 12-16 lbs.	Loins, 12-14 lbs.	Picnics, 6-8 lbs.	Hams, smoked, 14-16 lbs.	Bacon, breakfast, 6-8 lbs.	Lard, pure (tierces)	Hams	Loins, 12-14 lbs.	Picnics, 6-8 lbs.	Hams, smoked, 10-12 lbs., good	Bacon, breakfast, good	Lard, pure (tierces)
1924	*Dolls.*	*Dolls.*	*Dolls.*	*Dollars*	*Dollars*	*Dollars*	*Dolls.*	*Dolls.*	*Dolls.*	*Dollars*	*Dolls.*	*Dollars*
Jan.	15.25	12.41	8.55	19.85	17.10	14.52	16.90	13.53	9.25	21.20	18.20	14.23
Feb.	15.44	12.32	8.30	19.19	16.38	13.03	18.25	12.78	8.85	20.00	19.00	12.19
Mar.	15.31	13.00	8.58	19.38	17.38	12.84	17.44	13.46	8.68	19.62	20.00	12.00
Apr.	15.95	14.82	8.89	19.05	18.35	12.50	17.40	15.86	9.06	19.60	21.00	12.30
May	16.25	15.70	8.81	19.38	18.88	12.19	17.00	16.79	9.36	20.12	21.00	12.09
June	16.38	13.75	8.82	19.19	18.38	12.13	16.50	16.19	9.08	20.50	19.81	12.15
July	16.82	15.03	9.29	20.05	19.55	13.65	17.20	16.19	9.02	21.20	19.60	13.35
Aug.	18.44	18.26	10.36	21.44	22.85	15.94	20.50	21.15	11.90	23.00	22.69	15.72
Sept.	16.56	20.44	......	21.62	23.60	16.25	19.50	20.95	13.00	20.62	22.50	15.62
Oct.	18.10	20.86	......	21.35	26.65	18.05	20.50	22.65	15.13	21.90	23.10	17.32
Nov.	16.56	14.53	......	20.38	26.62	16.68	20.00	17.39	13.54	19.62	23.00	18.00
											8-10 lbs. good	
Dec.	17.90	14.90	......	20.70	25.20	18.00	19.20	15.79	12.28	19.00	23.75	17.13
Av.	16.58	15.50	......	20.13	20.91	14.65	18.37	16.89	10.76	20.53	......	14.34
		12-15 lbs.						12-15 lbs.				
1925												
Jan.	19.25	15.44	......	22.25	25.19	17.59	20.75	17.30	12.58	20.50	22.62	17.56
Feb.	20.19	15.21	......	22.25	25.62	17.03	19.88	16.81	12.32	20.78	23.00	16.88
Mar.	23.62	23.22	......	26.69	31.50	18.25	25.00	24.02	14.18	24.26	25.68	18.10
Apr.	24.25	20.82	......	26.70	33.20	17.07	25.00	22.68	15.13	25.33	29.00	18.05
May	21.56	20.45	......	24.88	32.28	16.50	24.50	22.58	14.50	23.85	28.55	16.84
June	23.31	19.98	......	25.47	33.91	18.13	24.12	22.18	14.62	24.50	29.38	17.34
July	25.40	23.12	......	28.90	35.20	18.42	26.60	24.94	[1] 15.52	26.88	31.46	18.82
Aug.	25.84	24.12	......	29.44	35.44	18.94	26.00	25.02	17.25	27.56	32.48	19.25
Sept.	24.56	25.74	......	28.30	35.70	18.95	26.40	27.60	17.80	26.60	31.98	19.05
Oct.	21.85	21.82	......	27.50	36.38	18.75	26.25	24.08	18.75	27.50	31.88	18.06
Nov.	21.62	22.00	......	27.12	34.50	18.50	25.50	25.26	17.41	26.81	30.25	17.56
Dec.	20.02	19.86	......	28.20	32.60	16.67	24.10	21.03	15.72	26.50	26.80	17.00
Av.	22.62	20.98	......	26.48	32.63	17.90	24.51	22.79	15.48	25.09	28.59	17.88
1926												
Jan.	21.75	20.85	......	29.25	32.25	16.81	25.62	21.91	17.18	27.88	26.12	16.22
Feb.	23.78	20.45	......	29.00	32.38	16.44	27.00	21.95	17.22	28.75	27.50	16.25
Mar.	26.10	21.62	......	29.10	33.05	16.70	27.40	23.08	17.97	28.50	27.50	16.10
Apr.	27.38	24.55	......	29.00	34.19	16.75	27.00	26.00	19.06	29.25	27.62	15.50
May	27.62	25.91	......	30.00	35.81	17.13	27.00	27.02	18.81	31.15	29.00	16.50
June	26.63	25.47	......	33.65	40.30	18.48	27.80	27.45	20.10	33.60	31.40	17.55
July	26.25	22.70	......	34.00	41.00	18.00	30.38	24.62	19.60	35.38	32.38	17.44
Aug.	25.75	20.38	......	33.88	40.75	17.38	29.00	22.28	18.40	33.62	31.50	16.38
Sept.	27.80	26.69	......	33.50	41.60	17.50	28.50	27.92	18.80	33.16	30.36	15.95
Oct.	26.38	28.50	......	32.25	41.25	16.75	27.75	29.68	17.85	31.38	29.88	15.50
Nov.	24.90	22.78	......	30.70	38.80	15.75	26.12	24.21	17.16	29.75	29.00	14.00
Dec.	23.38	20.72	......	29.30	36.40	15.25	24.90	22.68	16.20	27.10	26.94	13.70
Av.	25.64	23.38	......	31.14	37.32	16.91	27.37	24.90	18.20	30.79	29.10	15.92
	10-14 lbs.			Regular, No. 2 14-16 lbs.	No. 1 smoked, 6-8 lbs.	Refined (H. W. tubs)	10-14 lbs.			Regular, No. 2 10-12 lbs.		Refined (H. W. tubs)
1927												
Jan.	24.00	20.08	......	28.25	34.75	13.59	26.25	21.60	16.00	26.38	26.75	14.12
Feb.	23.62	19.54	......	27.50	34.38	13.72	26.12	20.81	16.00	25.62	26.25	13.56
Mar.	22.60	20.28	......	26.25	34.50	14.38	25.20	21.33	15.97	25.50	25.70	13.50
Apr.	22.62	20.10	......	26.12	34.38	14.32	24.00	20.74	16.15	25.50	25.50	13.88
May	21.50	18.65	......	25.75	33.75	14.12	23.50	19.48	14.70	25.00	25.38	14.12
June	20.20	16.99	......	24.60	32.45	13.35	23.00	17.78	13.30	24.02	23.20	14.00
July	20.50	17.16	......	22.50	32.00	12.25	21.00	18.50	13.45	22.90	22.38	13.75
Aug.	20.76	21.64	......	20.70	32.20	12.54	22.00	23.34	13.50	22.90	21.90	13.55
Sept.	21.00	26.38	......	20.25	34.75	14.25	21.38	27.80	13.85	23.38	22.00	14.06
Oct.	20.65	25.90	......	22.25	36.75	14.50	21.25	27.70	15.25	23.90	22.50	14.44
Nov.	18.60	19.23	......	22.10	36.60	13.60	19.00	19.98	14.22	22.95	21.90	14.10
Dec.	16.25	15.21	......	20.50	31.75	13.25	17.38	16.29	12.95	21.05	21.25	13.69
Av.	21.02	20.10	......	23.90	34.02	13.66	22.51	21.28	14.61	24.09	23.73	13.90

[1] 2-week average in 5-week month.

TABLE 412.—*Meats, western dressed, fresh and smoked: Average wholesale price per 100 pounds at Chicago and New York, by months, 1920–1927*—Continued

LAMB AND MUTTON

Year and month	Chicago					New York				
	Lamb				Mutton, good	Lamb				Mutton, good
	Choice	Good	Medium	Common		Choice	Good	Medium	Common	
1920	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
January	31.36	30.38	28.38	26.08	19.49	30.33	27.68	24.60	22.25	18.10
February	33.53	32.23	30.47	27.59	22.95	33.94	32.18	29.51	26.41	21.77
March	31.35	29.38	27.57	25.04	23.66	29.88	27.72	25.42	23.76	21.42
April	33.65	31.95	30.45	27.45	26.58	37.43	35.25	30.45	28.03	27.75
May	33.40	31.10	29.55	26.85	22.95	32.15	30.25	27.70	24.83	20.31
June	32.47	29.84	27.40	25.16	19.06	31.33	28.00	25.03	21.91	18.61
July	33.71	31.10	27.40	22.75	14.83	33.30	29.83	25.88	20.13	22.97
August	30.03	27.68	24.60	20.55	14.60	28.25	25.98	22.53	18.28	16.28
September	28.62	26.38	24.12	21.16	13.54	28.82	26.66	24.02	20.18	15.07
October	25.00	23.20	21.18	18.10	11.35	25.78	23.15	20.73	15.66	13.82
November	26.81	24.59	21.96	18.56	12.65	27.22	25.30	22.85	18.59	14.53
December	24.36	22.26	19.98	16.96	11.86	26.24	24.34	22.38	18.34	12.24
Average	30.36	28.34	26.09	23.02	17.79	30.39	28.03	25.09	21.53	18.57
1921										
January	24.20	22.05	19.18	15.78	11.05	25.78	24.53	22.33	--------	13.40
February	19.24	17.26	15.50	13.18	9.85	20.33	18.58	16.72	--------	10.97
March	21.92	19.28	17.26	14.68	13.72	22.40	20.68	18.48	--------	12.82
April	21.25	18.75	16.25	13.75	14.43	22.75	20.68	18.88	--------	15.26
May	23.95	21.53	19.03	15.78	15.05	25.98	24.23	22.05	--------	15.55
June	23.60	20.88	18.06	14.32	12.98	26.88	24.55	21.88	17.14	12.84
July	25.68	23.50	20.68	17.28	12.18	25.75	23.53	20.94	15.79	15.40
August	23.02	20.46	18.22	15.50	12.26	23.34	21.26	19.12	14.44	12.28
September	19.70	17.70	15.45	11.93	10.53	20.73	19.00	16.75	12.40	12.01
October	17.85	16.25	14.08	11.28	10.20	19.24	17.90	16.05	12.92	11.25
November	19.16	17.86	15.36	12.06	9.83	21.26	19.70	17.31	[1] 15.40	10.33
December	23.80	21.62	19.58	17.08	11.05	26.65	24.98	22.85	20.37	13.30
Average	21.95	19.76	17.39	14.38	11.93	23.42	21.64	19.45	--------	12.95
1922										
January	25.20	24.01	22.07	19.57	13.25	27.53	25.90	24.15	21.90	16.25
February	27.80	26.75	25.72	23.28	17.00	28.13	26.02	23.95	21.45	16.30
March	28.70	27.70	26.12	23.62	18.26	28.86	27.38	25.58	23.08	18.70
April	30.05	28.88	27.20	24.15	20.10	30.10	28.38	26.00	23.75	18.72
May	29.86	28.54	27.02	24.81	19.76	30.30	27.32	24.86	22.74	20.08
June	25.92	24.25	22.55	18.88	15.90	24.72	21.82	18.72	14.98	14.95
July	27.47	25.88	23.22	18.18	14.24	26.86	23.30	21.15	16.42	16.45
August	26.46	24.50	22.00	17.28	14.50	26.61	24.04	22.98	19.32	15.15
September	27.49	25.69	23.27	17.25	15.05	28.45	25.70	23.60	19.27	15.18
October	26.25	24.60	22.42	18.12	14.68	26.48	24.52	21.85	17.75	14.82
November	25.56	23.62	21.86	18.61	15.06	25.96	24.15	21.79	19.16	14.26
December	26.02	24.25	22.25	19.19	14.47	26.16	24.45	22.32	20.12	15.48
Average	27.23	25.72	23.81	20.24	16.02	27.51	25.25	23.08	20.00	16.36
1923										
Janaury	25.06	24.06	22.06	19.00	14.25	25.77	24.19	21.90	19.82	15.06
February	24.15	22.70	20.78	18.55	13.79	24.31	22.94	20.97	19.92	14.01
March	24.55	21.80	18.82	16.82	12.50	24.95	23.90	22.85	21.02	14.00
April	24.28	22.15	19.12	17.35	14.20	24.94	23.85	22.60	20.80	16.54
May	27.91	25.71	24.07	22.19	17.96	28.40	26.79	24.80	23.58	16.54
June	28.52	26.45	24.45	22.28	15.55	30.22	28.30	26.18	22.72	14.52
July	30.15	27.72	24.95	18.55	15.55	27.81	26.01	23.64	19.72	17.00
August	27.68	25.54	23.56	19.06	16.67	28.27	26.38	23.60	20.01	18.93
September	27.92	25.92	24.18	20.86	18.45	28.20	26.75	23.39	19.36	15.92
October	25.08	22.94	20.88	17.18	13.48	24.30	22.70	20.84	18.06	14.28
November	24.26	22.50	20.53	17.19	13.00	24.76	23.76	22.26	19.26	15.20
December	23.45	21.72	20.08	17.52	13.40	24.12	23.12	21.22	19.00	15.49
Average	26.08	24.10	21.96	18.83	14.90	26.34	24.89	22.85	20.27	15.62

[1] 2-week average in 5-week month.

TABLE 412.—*Meats, western dressed, fresh and smoked: Average wholesale price per 100 pounds at Chicago and New York, by months, 1920–1927*—Continued

LAMB AND MUTTON—Continued

Year and month	Chicago: Lamb: Choice		Chicago: Lamb: Good		Chicago: Lamb: Medium	Chicago: Lamb: Common	Chicago: Mutton, good	New York: Lamb: Choice		New York: Lamb: Good		New York: Lamb: Medium	New York: Lamb: Common	New York: Mutton, good
1924	*Dollars*		*Dollars*		*Dolls.*	*Dolls.*	*Dolls.*	*Dollars*		*Dollars*		*Dolls.*	*Dolls.*	*Dolls.*
January	23.06		21.16		19.80	17.34	14.44	23.32		21.94		20.19	19.04	15.84
February	23.78		22.15		19.78	18.05	14.55	24.89		23.51		21.80	19.33	17.50
March	27.50		25.72		24.35	21.85	18.25	28.28		26.82		25.28	------	19.98
April	27.98		26.66		24.86	22.26	19.34	29.94		28.72		27.28	25.67	19.10
May	29.10		28.00		26.10	23.85	17.21	30.01		28.25		26.60	25.15	16.51
June	27.98		25.90		23.32	20.08	16.28	27.82		26.19		24.28	22.22	13.48
July	27.85		26.20		22.44	17.25	13.60	27.80		25.75		23.13	19.69	15.38
August	26.00		23.79		19.69	15.08	14.51	25.85		23.80		21.08	17.35	15.25
September	24.96		22.71		20.09	16.59	13.41	24.72		22.61		20.26	17.48	14.40
October	21.83		18.87		17.34	15.37	13.25	22.24		20.70		19.32	16.86	12.82
November	22.55		20.82		18.70	16.59	12.50	22.44		21.19		20.08	18.38	15.12
December	25.12		22.97		20.63	18.46	12.91	26.88		25.51		24.16	19.82	15.40
Average	25.64		23.75		21.42	18.56	15.02	26.18		24.58		22.79	------	15.90
1925														
January	27.35		25.65		24.10	20.68	14.00	28.90		27.70		26.45	25.43	15.62
February	27.70		25.90		24.32	21.32	14.50	28.58		27.55		25.80	------	15.20
March	26.62		24.80		23.25	20.50	15.85	27.52		25.72		24.02	20.20	17.18
April	24.68		23.20		21.28	18.70	14.56	26.12		24.09		21.49	------	16.70
May	25.35		23.50		21.22	18.75	14.25	26.32		24.60		22.35	------	17.35
June	28.85		26.88		24.00	20.42	13.62	28.15		25.82		23.05	20.24	13.72
July	30.04		27.78		25.00	21.10	14.50	29.26		27.60		25.28	22.18	15.42
August	29.00		27.02		24.28	20.70	14.50	27.96		25.95		24.08	20.60	13.82
September	28.92		26.66		24.48	20.54	14.22	29.00		26.94		24.94	21.47	14.48
	30 to 42 lbs.	42 to 55 lbs.	30 to 42 lbs.	42 to 55 lbs.				30 to 42 lbs.	42 to 55 lbs.	30 to 42 lbs.	42 to 55 lbs.			
October	27.48	25.12	25.15	23.48	22.98	19.72	14.68	28.00	25.85	26.10	24.18	23.22	20.75	15.65
November	29.20	26.90	27.40	25.15	25.28	21.55	14.19	28.90	26.95	27.38	25.05	23.85	21.75	16.38
December	29.41	27.14	27.50	25 28	25.61	23.02	15.00	29.82	27.68	28.56	26.29	24.95	23.21	16.61
Average	------	------	------	------	23.82	20.58	14.49	------	------	------	------	24.12	------	15.68
1926														
January	28.42	25.55	26.58	23.72	24.98	23.28	15.65	28.75	27.38	27.45	26.30	25.75	24.55	16.65
February	25.40	23.02	23.45	21.15	22.35	21.10	15.00	25.26	23.86	24.14	22.06	21.74	------	15.72
March	24.20	21.06	22.28	19.28	21.60	19.80	15.00	24.38	22.34	22.34	21.34	21.84	------	16.42
April	27.10	24.70	25.15	22.95	24.58	22.70	15.45	26.95	26.18	25.65	24.10	23.92	------	17.90
May	31.32	28.98	29.42	27.25	27.45	26.08	16.40	30.82	29.78	29.48	28.52	27.85	------	16.38
June	32.44	30.24	30.36	28.72	27.76	25.30	13.38	31.23	[1] 31.88	30.17	[1] 30.88	28.88	24.40	15.18
July	30.02	27.98	27.79	26.64	24.60	20.70	12.05	28.61	------	26.81	------	25.44	23.24	15.95
August	29.50	26.48	27.60	25.05	24.85	20.75	13.12	29.35	------	27.82	------	25.50	21.70	13.22
September	28.19	25.05	25.93	23.97	23.28	19.87	13.14	27.54	------	25.44	------	23.23	20.34	13.74
October	26.22	22.92	24.08	21.62	22.12	19.15	13.00	25.50	24.15	23.50	23.15	21.40	20.25	12.09
November	26.24	22.25	24.37	21.22	22.26	19.76	13.50	26.66	25.64	24.94	24.44	24.00	21.26	13.80
December	25.38	20.92	23.08	19.66	21.20	18.98	14.84	25.70	24.38	24.02	23.04	22.18	19.98	13.18
Average	27.87	24.93	25.84	23.44	23.92	21.46	14.21	27.56	------	25.98	------	24.31	------	15.02
1927														
January	24.90	21.28	23.30	19.90	21.45	19.48	14.50	24.40	22.75	22.92	21.65	20.75	19.25	14.45
February	25.40	21.82	23.55	19.92	21.70	19.62	16.15	24.80	23.46	23.31	22.74	22.14	19.96	15.25
March	29.72	26.08	27.72	24.90	25.76	23.64	17.60	29.10	28.04	27.48	27.14	26.12	23.84	17.10
April	31.58	29.00	30.05	27.30	28.35	26.82	20.10	31.98	30.50	30.12	29.32	28.00	26.82	18.10
May	32.20	31.12	30.40	29.58	28.32	26.25	17.80	32.82	31.60	31.45	29.88	29.08	28.20	17.95
June	31.13	[1] 31.62	28.99	[1] 29.62	26.49	23.77	15.16	30.95	29.02	28.96	27.82	26.14	22.96	14.28
July	29.35	------	27.40	------	24.25	20.95	14.00	29.38	27.39	27.25	26.25	24.39	20.28	16.10
August	27.30	26.33	25.52	24.87	22.98	19.72	14.38	26.36	25.10	24.62	23.86	22.10	18.64	15.26
September	25.81	24.61	23.90	23.40	21.90	18.90	13.70	25.60	24.80	24.30	23.39	21.42	18.42	12.42
October	24.82	22.92	23.00	21.92	21.00	18.50	13.00	24.80	23.82	23.80	22.85	20.92	18.52	12.28
November	25.23	23.11	23.63	22.11	21.61	19.61	13.00	24.10	23.06	23.10	22.06	20.94	18.48	12.95
December	24.81	22.70	23.64	21.70	21.56	19.82	13.60	24.91	22.52	23.29	20.62	19.60	18.08	13.29
Average	27.69	------	25.92	------	23.78	21.42	15.25	27.43	26.00	25.88	24.80	23.47	21.12	14.95

Bureau of Agricultural Economics. Compiled from data of the livestock and meat reporting service of the bureau.

[1] 2-week average in 5-week month.

TABLE 413.—*Hides, packer: Average price per pound at Chicago, averages 1894–1925; annual, 1920–1927*

Year	Steers					Cows			Bulls	
	Heavy native	Heavy Texas	Light Texas	Butt branded	Colorados	Heavy native	Light native	Branded	Native	Branded
Average:	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1894–1898	9.24	8.68	8.06	8.23	7.53	8.28	8.30	7.53	7.25	5.83
1899–1903	12.34	12.80	11.56	11.37	11.01	10.75	10.13	10.03	10.05	8.45
1904–1908	13.86	13.96	13.23	12.67	12.49	12.65	12.24	11.94	10.85	9.46
1909–1913	16.53	16.05	15.30	15.26	15.06	15.31	15.03	14.39	13.21	11.89
1914–1920	29.17	26.74	25.87	26.32	25.55	27.86	26.89	24.43	22.66	20.08
1921–1925	15.76	14.67	13.47	14.64	13.64	14.10	13.28	11.66	10.83	9.25
1920	31.65	27.52	26.38	27.25	26.02	31.08	29.23	24.93	24.97	22.28
1921	13.88	13.10	11.43	12.83	11.85	12.41	11.37	10.00	8.40	7.13
1922	17.83	16.57	15.29	16.51	15.59	16.10	15.16	13.47	11.96	10.15
1923	16.46	14.79	13.77	14.89	13.86	14.21	12.94	11.11	11.69	9.89
1924	14.67	13.82	12.80	13.80	12.79	12.95	12.29	10.41	10.14	8.79
1925	15.96	15.08	14.06	15.16	14.12	14.82	14.62	13.30	11.98	10.29
1926	14.08	13.38	12.67	13.34	12.82	12.71	13.11	12.05	9.98	8.50
1927	19.28	18.21	17.49	18.23	17.74	18.08	18.66	17.26	14.09	12.88

Bureau of Agricultural Economics. Compiled from annual reports of the Chicago Board of Trade. Data 1893–1919 available in 1925 Yearbook, p. 1199, Table 610.

TABLE 414.—*Hides, country: Average price per pound at Chicago, averages 1894–1925; annual, 1920–1927*

Year	Extremes	Heavy steers	Heavy cows	No. 1 buffs	No. 2 buffs	Bulls	Country packer brands	Country brands	No. 1 calfskins	No. 1 kipskins
Average:	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1894–1898	8.06	8.11	7.56	7.54	7.05	6.43	7.15	6.84	10.55	8.94
1899–1903	9.28	10.46	9.35	9.05	8.20	8.33	9.31	8.65	12.12	10.06
1904–1908	11.21	11.80	11.05	10.97	9.95	9.29	10.67	9.91	14.56	11.88
1909–1913	13.67	13.64	13.11	13.06	12.07	10.99	12.20	11.36	17.21	14.42
1914–1920	23.35	23.07	21.05	21.03	19.88	18.14	21.48	17.82	38.79	29.23
1921–1925	11.96	11.40	9.90	10.06	8.89	7.98	10.48	8.24	19.39	16.61
1920	22.79	24.20	19.27	18.93	17.93	18.76	20.60	414.94	40.98	33.97
1921	8.95	9.35	7.32	7.10	5.77	5.43	7.43	5.33	18.57	15.58
1922	12.93	12.03	10.85	10.86	9.52	8.23	12.53	8.42	18.95	17.29
1923	11.65	11.39	10.43	10.45	9.26	8.93	10.12	8.70	17.18	15.42
1924	11.86	11.31	9.24	9.63	8.63	7.86	9.81	8.23	20.39	16.62
1925	14.41	12.94	11.64	12.26	11.25	9.46	12.52	10.54	21.88	18.12
1926	13.46	11.63	9.54	10.70	9.70	8.03	10.52	9.00	18.02	16.12
1927	18.60	16.02	14.85	16.26	15.26	11.49	15.54	13.89	20.47	19.96

Bureau of Agricultural Economics. Compiled from annual reports of the Chicago Board of Trade. Data 1893–1919 available in 1925 Yearbook, p. 1199, Table 611.

TABLE 415.—*Horses and mules: Number and value on farms, United States, January 1, 1910–1928*

Jan. 1—	Horses			Mules		
	Number	Price per head Jan. 1	Farm value Jan. 1	Number	Price per head Jan. 1	Farm value Jan. 1
	Thousands	*Dollars*	*1,000 dollars*	*Thousands*	*Dollars*	*1,000 dollars*
Average 1914–1920	21,047	102.38	2,154,764	4,785	126.62	605,889
1910, Apr. 15	*19,833*	108.03	2,142,524	*4,210*	120.20	506,049
1911	20,277	111.46	2,259,981	4,323	125.92	544,359
1912	20,509	105.94	2,172,694	4,362	120.51	525,657
1913	20,567	110.77	2,278,222	4,386	124.31	545,245
1914	20,962	109.32	2,291,638	4,449	123.85	551,017
1915	21,195	103.33	2,190,102	4,479	112.36	503,271
1916	21,159	101.60	2,149,786	4,593	113.83	522,834
1917	21,210	102.89	2,182,307	4,723	118.15	558,006
1918	21,555	104.24	2,246,970	4,873	128.81	627,679
1919	21,482	98.45	2,114,897	4,954	135.83	672,922
1920	19,848	96.52	1,915,653	5,475	148.46	812,828
1921	19,134	84.57	1,618,120	5,586	117.52	656,455
1922	18,564	71.18	1,321,396	5,638	89.14	502,563
1923	17,943	70.65	1,267,624	5,702	87.17	497,044
1924	17,222	65.48	1,127,619	5,730	85.90	492,209
1925	16,470	64.29	1,058,912	5,725	82.73	473,646
1926	15,830	65.50	1,036,843	5,740	81.49	467,760
1927	15,145	64.13	971,258	5,679	74.49	423,010
1928 [1]	14,541	67.07	975,298	5,566	79.60	443,097

Bureau of Agricultural Economics. Estimates of the crop-reporting board. Figures in italics are census returns.

[1] Preliminary.

TABLE 416.—*Horses and horse colts: Estimated number on farms and value per head, by States, January 1, 1924–1928*

State	Number Jan. 1					Value per head Jan. 1				
	1924	1925	1926	1927	1928 [1]	1924	1925	1926	1927	1928 [1]
	Thousands	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
Maine	85	84	80	78	76	124.00	119.00	129.00	130.00	135.00
New Hampshire	34	32	30	28	27	113.00	105.00	100.00	105.00	120.00
Vermont	67	64	61	57	55	107.00	104.00	110.00	110.00	119.00
Massachusetts	46	45	41	39	37	136.00	124.00	119.00	119.00	133.00
Rhode Island	6	6	6	5	5	125.00	124.00	120.00	120.00	135.00
Connecticut	35	35	33	32	31	130.00	127.00	120.00	128.00	140.00
New York	465	440	418	401	389	111.00	108.00	111.00	109.00	116.00
New Jersey	60	57	54	54	52	116.00	109.00	107.00	109.00	109.00
Pennsylvania	433	410	390	374	359	100.00	96.00	103.00	99.00	112.00
Ohio	690	630	598	568	542	81.00	85.00	91.00	95.00	101.00
Indiana	570	556	548	540	522	67.00	69.00	78.00	80.00	82.00
Illinois	1,090	1,030	978	929	888	68.00	69.00	74.00	74.00	74.00
Michigan	520	482	463	444	426	81.00	84.00	89.00	89.00	98.00
Wisconsin	626	604	591	579	572	97.00	88.00	93.00	95.00	98.00
Minnesota	852	835	827	819	810	72.00	77.00	81.00	77.00	79.00
Iowa	1,240	1,180	1,145	1,111	1,067	75.00	72.00	74.00	74.00	74.00
Missouri	765	708	670	636	604	49.00	48.00	49.00	48.00	50.00
North Dakota	760	731	708	673	633	51.00	56.00	56.00	53.00	53.00
South Dakota	742	720	684	643	611	50.00	48.00	49.00	47.00	53.00
Nebraska	852	862	840	815	782	57.00	58.00	61.00	56.00	60.00
Kansas	958	931	894	840	790	43.00	46.00	48.00	41.00	43.00
Delaware	22	23	22	21	20	64.00	74.00	79.00	69.00	64.00
Maryland	119	117	112	104	100	77.00	74.00	77.00	78.00	89.00
Virginia	272	261	238	224	206	77.00	71.00	66.00	66.00	70.00
West Virginia	145	147	140	133	131	80.00	76.00	75.00	74.00	84.00
North Carolina	138	130	120	112	105	103.00	99.00	86.00	83.00	87.00
South Carolina	58	55	49	45	42	103.00	97.00	89.00	77.00	81.00
Georgia	64	56	51	46	41	82.00	86.00	83.00	74.00	78.00
Florida	36	29	28	27	26	98.00	98.00	97.00	84.00	83.00
Kentucky	330	314	305	293	284	56.00	50.00	50.00	47.00	53.00
Tennessee	270	243	231	219	210	66.00	61.00	53.00	54.00	60.00
Alabama	99	90	86	82	73	78.00	70.00	68.00	63.00	66.00
Mississippi	155	135	125	118	106	69.00	63.00	60.00	56.00	61.00
Arkansas	200	188	169	157	147	43.00	42.00	42.00	40.00	43.00
Louisiana	140	132	126	120	114	67.00	62.00	55.00	49.00	52.00
Oklahoma	640	614	589	565	542	35.00	41.00	37.00	35.00	38.00
Texas	900	857	848	788	748	56.00	54.00	48.00	44.00	45.00
Montana	611	596	576	547	536	33.00	32.00	29.00	30.00	31.00
Idaho	250	233	226	221	214	53.00	45.00	52.00	52.00	51.00
Wyoming	198	200	198	194	190	31.00	29.00	29.00	31.00	31.00
Colorado	385	367	352	331	324	45.00	43.00	47.00	44.00	43.00
New Mexico	184	188	175	170	170	40.00	38.00	37.00	33.00	31.00
Arizona	118	112	106	101	98	64.00	59.00	50.00	50.00	49.00
Utah	118	110	106	104	102	64.00	61.00	61.00	61.00	61.00
Nevada	53	50	47	44	44	56.00	56.00	53.00	53.00	60.00
Washington	251	242	230	218	209	72.00	63.00	62.00	62.00	65.00
Oregon	235	225	214	201	191	71.00	67.00	65.00	62.00	65.00
California	335	314	302	295	290	85.00	78.00	76.00	76.00	73.00
United States	17,222	16,470	15,830	15,145	14,541	65.48	64.29	65.50	64.13	67.07

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

[1] Preliminary.

TABLE 417.—*Mules and mule colts: Estimated number on farms and value per head, by States, January 1, 1924–1928*

State	Number, Jan. 1					Value per head Jan. 1				
	1924	1925	1926	1927	1928 [1]	1924	1925	1926	1927	1928 [1]
	Thousands	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
New York	8	7	7	7	7	109.00	115.00	112.00	120.00	125.00
New Jersey	5	5	5	5	5	124.00	125.00	114.00	118.00	118.00
Pennsylvania	55	53	53	52	51	113.00	105.00	113.00	110.00	121.00
Ohio	33	33	32	33	33	92.00	93.00	96.00	94.00	103.00
Indiana	102	101	99	101	101	75.00	76.00	86.00	86.00	86.00
Illinois	169	168	165	160	157	80.00	80.00	85.00	85.00	82.00
Michigan	7	7	7	8	8	84.00	83.00	86.00	86.00	93.00
Wisconsin	7	7	7	7	7	73.00	85.00	87.00	82.00	95.00
Minnesota	13	13	13	14	14	77.00	80.00	79.00	81.00	86.00
Iowa	99	97	98	100	103	86.00	83.00	85.00	83.00	83.00
Missouri	400	372	365	347	340	69.00	67.00	71.00	66.00	68.00
North Dakota	10	9	9	10	10	57.00	62.00	59.00	55.00	57.00
South Dakota	20	21	22	22	22	61.00	61.00	64.00	56.00	60.00
Nebraska	121	120	120	118	116	73.00	74.00	78.00	69.00	74.00
Kansas	282	260	252	237	213	61.00	63.00	66.00	57.00	60.00
Delaware	9	9	9	9	9	85.00	90.00	100.00	91.00	95.00
Maryland	31	31	31	30	29	104.00	94.00	104.00	101.00	113.00
Virginia	102	104	104	103	105	100.00	91.00	87.00	86.00	92.00
West Virginia	15	15	15	14	14	88.00	86.00	85.00	78.00	81.00
North Carolina	273	279	276	279	282	129.00	119.00	117.00	107.00	119.00
South Carolina	203	199	193	185	179	134.00	122.00	120.00	95.00	105.00
Georgia	350	338	347	347	357	109.00	115.00	112.00	95.00	105.00
Florida	45	43	43	43	43	142.00	139.00	134.00	117.00	119.00
Kentucky	293	301	304	301	295	67.00	63.00	63.00	58.00	67.00
Tennessee	360	352	356	352	341	81.00	74.00	72.00	69.00	75.00
Alabama	299	309	312	315	321	100.00	90.00	95.00	84.00	95.00
Mississippi	320	330	336	343	336	96.00	89.00	86.00	79.00	87.00
Arkansas	339	339	346	349	335	62.00	64.00	63.00	59.00	64.00
Louisiana	180	174	176	176	167	94.00	90.00	90.00	79.00	85.00
Oklahoma	360	369	369	365	354	56.00	61.00	57.00	51.00	52.00
Texas	1,005	1,042	1,052	1,031	1,000	87.00	83.00	75.00	69.00	70.00
Montana	11	11	11	11	11	51.00	47.00	50.00	45.00	47.00
Idaho	8	8	8	8	7	62.00	52.00	61.00	60.00	55.00
Wyoming	5	6	6	6	5	50.00	49.00	49.00	49.00	52.00
Colorado	38	39	38	36	36	61.00	57.00	59.00	55.00	56.00
New Mexico	31	33	34	34	31	59.00	58.00	54.00	45.00	45.00
Arizona	12	12	12	12	12	90.00	85.00	87.00	77.00	77.00
Utah	4	4	4	4	4	66.00	62.00	64.00	62.00	61.00
Nevada	4	4	4	4	4	60.00	62.00	64.00	60.00	61.00
Washington	26	27	27	28	29	80.00	68.00	67.00	72.00	73.00
Oregon	17	18	19	20	20	73.00	72.00	73.00	70.00	72.00
California	59	56	54	53	53	106.00	95.00	92.00	89.00	83.00
United States	5,730	5,725	5,740	5,679	5,566	85.90	82.73	81.49	74.49	79.60

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

[1] Preliminary.

TABLE 418.—*Horses and mules: Farm value per head, by age groups, United States, January 1, 1910–1928*

Jan. 1—	Horses			Mules		
	Under 1 year old	1 and under 2 years	2 years and over	Under 1 year old	1 and under 2 years	2 years and over
	Dollars	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
1910	46.05	72.63	116.57	56.76	84.53	128.96
1911	48.09	75.68	120.04	59.89	88.13	135.11
1912	45.75	71.96	114.24	56.12	83.00	129.46
1913	48.75	76.54	121.06	59.31	86.56	134.05
1914	47.95	74.87	119.77	57.45	83.87	133.76
1915	45.36	70.62	113.10	51.80	76.46	121.46
1916	44.30	69.08	111.34	51.59	76.82	123.55
1917	45.17	70.21	112.64	53.98	80.28	128.17
1918	45.20	70.21	114.30	57.61	86.32	139.88
1919	42.62	65.94	108.17	59.14	89.14	147.65
1920	37.22	58.81	103.52	60.16	90.14	160.55
1921	31.59	49.66	90.35	47.55	71.77	125.85
1922	26.50	41.07	75.61	35.55	52.82	94.81
1923	26.51	40.48	74.53	34.35	50.94	92.14
1924	24.68	37.36	68.64	31.83	47.06	90.42
1925	23.80	37.09	66.83	30.65	46.63	86.20
1926	24.82	37.75	68.18	31.30	47.88	84.76
1927	23.69	37.29	66.75	29.31	43.88	77.31
1928	25.02	39.29	69.87	31.10	46.52	82.60

Bureau of Agricultural Economics. Based on returns from special price reporters.

TABLE 419.—*Horses: Price per head received by producers, United States, 1910–1927*

Year	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	July 15	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Weighted av.
	Dolls.	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
Average:													
1910–1913	139	144	145	148	146	147	143	143	142	140	138	137	142
1914–1920	127	130	132	133	134	133	132	130	127	125	122	121	128
1921–1925	81	84	86	86	87	86	85	83	82	80	78	76	82
1910	140	147	150	154	148	151	148	148	145	144	143	141	146
1911	143	144	145	147	146	145	139	141	139	137	136	134	141
1912	134	137	140	142	144	145	142	142	141	140	139	139	140
1913	140	146	146	148	145	146	143	141	141	138	136	135	142
1914	137	139	138	138	139	136	137	135	132	131	130	130	135
1915	130	132	132	132	133	132	134	131	131	129	127	126	130
1916	128	129	131	133	134	132	133	131	131	130	129	129	130
1917	129	131	133	136	138	137	135	132	132	130	129	129	132
1918	130	133	137	137	136	135	132	131	128	126	122	121	130
1919	120	121	124	127	129	127	127	125	119	114	113	113	121
1920	118	123	127	131	132	130	127	124	119	112	103	97	119
1921	96	98	101	100	98	98	94	93	89	85	82	81	92
1922	82	84	86	87	89	88	88	86	84	81	79	79	84
1923	81	85	85	86	88	87	85	83	82	80	78	75	82
1924	73	74	75	76	78	77	77	79	78	77	76	73	76
1925	73	78	81	83	82	81	81	80	77	76	75	74	78
1926	75	80	82	84	84	83	82	80	78	77	75	73	79
1927	73	77	79	80	81	80	80	80	78	76	75	75	77

Bureau of Agricultural Economics. Based on returns from special price reporters.

TABLE 420.—*Honey: Monthly average prices in producing sections and at consuming markets, 1920–1926*

EXTRACTED HONEY, PER POUND

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
CALIFORNIA WHITE ORANGE												
F. o. b. Southern California shipping points:[1]	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1920	18¼	18¼	17¾	17¼	21	19¾	19½	19¼	18½	18¼	17¾	16¾
1921	16¼	13¾	13	12	11¼	11¼	9¼	10½	11	11¾	12¼	11½
1922	11½	11½	11	------	8½	9	9½	9½	9½	10¼	10¾	10¾
1923	10¾	10½	10¼	10¼	11¾	------	12	------	------	------	------	13¼
1924	13	------	14	14½	11¾	13¼	12	12½	13	13¼	14½	14¼
1925	14¼	------	15	------	13½	13	11¾	11¾	------	14½	15½	------
1926	12¼	11¾	11½	10½	9½	8¾	8¾	------	------	8½	------	------
1927	------	7¾	9	8¾	8	8¼	8¾	9	9¼	9½	9½	10
New York City:[2]												
1920	20¾	18¾	17½	19¼	20	21¾	18	17¼	18¾	17	17	16¼
1921	17½	14¾	12¼	11	11½	12	11½	11	12¼	12½	12¾	12¾
1922	13½	13	13¼	12½	13	12	11¾	11¾	11¾	12	12½	12¾
1923	12¾	12¾	12¾	12¾	13	13½	13¾	13¾	14½	14	15	16
1924	15½	16	15	15½	15½	13½	14½	14	------	13¾	13½	------
1925	------	------	------	------	------	14¼	------	14½	14¼	13½	14	14½
1926	15¼	15	14½	------	------	------	11¼	11	11½	11¾	11¾	12½
1927	12½	12½	11	------	11	11¼	11½	12¾	13	12¾	13	13
INTERMOUNTAIN WHITE SWEET CLOVER AND ALFALFA												
F. o. b. Intermountain points:[3]												
1921	------	------	------	8¼	7¾	7½	7¼	7¾	7¾	7¾	8	8½
1922	8½	8½	8½	8½	8½	8¾	9¼	------	8	8	8	8
1923	7¾	8	7¼	7½	7½	7¾	8½	8¾	8	9	9	9
1924	9	9¼	9¼	9¼	9¼	9	8¾	9	9	9	9	9¼
1925	9½	9¼	9¼	9¼	9	------	8½	8½	8½	8½	8½	8½
1926	8	8¼	8	7¾	7½	7½	7½	7	6¾	6¾	6¾	6¾
1927	6¾	6½	6	5¾	5¾	6	6	6¾	7	7½	7¾	7¼

[1] Price to beekeepers or other shippers in car lots to July, 1923; thereafter, price in large lots, mostly less than car lots.
[2] Sales by original receivers to bottlers, confectioners, bakers, and jobbers.
[3] Price to beekeepers and other shippers, in car lots.

TABLE 420.—*Honey: Monthly average prices in producing sections and at consuming markets, 1920–1926*—Continued

EXTRACTED HONEY, PER POUND—Continued

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
WHITE CLOVER												
F. o. b. New York and North Central States: [4]	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1921	------	------	------	------	------	------	------	------	9¾	9¾	9¾	10¾
1922	10½	10	10¾	10¾	10½	11¼	11½	11	11	11	10¾	11
1923	11	10¾	10	10	10½	11	11	11¾	11¼	10¾	10¾	10¾
1924	10¾	10¾	10¾	11	11	10¾	10½	11	10¾	10¾	11¼	11
1925	11¼	11¼	11¼	11¼	11½	11½	11½	10¾	11	11	10¾	10½
1926	9¾	10	9¼	9¾	9	9½	10¼	10	9½	9½	10	9½
1927	10¼	10	9½	9½	9¼	8¾	8½	9	8½	8½	8¾	8½
NORTHEASTERN BUCKWHEAT												
F. o. b. New York and Pennsylvania points: [4]												
1921	------	------	------	------	------	------	------	------	9	8¼	7½	8
1922	7	8	7½	7½	------	8	8½	6½	7¾	8	8	8
1923	7¾	8	8½	------	------	8	------	9	9	9¼	9	9
1924	9	9	8½	8¾	8½	8½	8¼	------	9	9¼	9	9
1925	8¾	9	10	9	------	------	------	9¼	9	8½	8½	8¾
1926	8	7¾	7½	7	6½	6½	6	6½	7	7	7	8
1927	8¼	7	7¼	------	8½	------	------	8	7½	7¼	7¼	7½

COMB HONEY, 24-SECTION CASES

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
WHITE CLOVER COMB, NO. 1 AND FANCY												
F. o. b. New York and North Central States: [4]	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1921	------	------	------	------	------	------	------	------	5.10	5.00	5.10	4.65
1922	5.00	5.10	5.00	4.50	------	------	4.45	5.00	4.55	4.90	4.70	4.70
1923	4.75	4.75	------	------	4.00	------	5.00	5.00	5.25	5.10	4.75	5.15
1924	4.75	4.75	5.05	4.80	5.50	------	4.80	4.85	4.95	4.80	5.10	4.95
1925	4.95	4.95	4.75	4.90	5.25	4.50	5.10	5.20	5.00	5.00	4.65	4.45
1926	4.25	4.25	4.25	4.00	4.00	4.00	4.25	4.75	4.50	4.25	4.25	4.25
1927	4.50	5.25	5.25	5.25	------	5.00	5.00	4.75	4.25	4.75	4.50	4.80

Bureau of Agricultural Economics.

[4] Price to beekeepers in large lots, mostly less than car lots.

BEESWAX

TABLE 421.—*Beeswax: Monthly average price per pound of domestic beeswax at Chicago, 1920–1926*

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Chicago: [1]												
Light—	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1920	44	41½	42¾	43¾	45¾	44	43¼	41	40	40¼	37	34¾
1921	31½	31¼	30½	31	32¼	31½	31¾	29	29	30¼	30¼	31
1922	31	31	29¾	28¾	33	31¼	31½	30¾	31	31½	31½	30½
1923	30¾	31½	32	32½	32	32	31	29	30	30	29	29½
1924	29¼	28½	29	31¼	28¾	27½	27	27	29	32½	32¼	33¼
1925	35	35	38	41¾	38	35	33½	33½	34	37¾	38	38
1926	------	40	------	------	------	------	39½	38½	38½	39½	39	39
1927	39	39	40	40	40	40½	41	41	41	43	41½	41½
Dark—												
1920	38½	36¼	39	40¾	42	40½	39½	37	35½	36½	34½	32¼
1921	29¼	28½	27¾	25¾	25¼	27¾	26¼	25¾	26½	27	27¼	27½
1922	28½	28	24½	25½	29	28	29	28	27¼	28	27¾	27¾
1923	28	28½	28½	28¾	29	29¼	28½	25½	25¼	26	26	24
1924	26	26¼	26	27	25¼	25½	25½	24½	26	29	28	27½
1925	31	31	33¾	36¾	34	29½	29½	29¾	29½	34½	34	34
1926	------	------	------	------	------	------	33	33	------	------	------	------
1927	------	------	34½	34½	34½	35	35	35	35	37	38	38

Bureau of Agricultural Economics.

[1] Sales by original receivers to wholesalers, polish and laundry-supply manufacturers, etc.

DAIRY AND POULTRY

TABLE 422.—*Milk cows or dairy cattle: Numbers and prices to producers in the United States, 1850, 1860, 1867–1928*

Year	Milk cows: On farms	Milk cows: Price per head to producers, Jan. 1	Dairy cattle on farms and elsewhere [1]	Year	Milk cows: On farms	Milk cows: Price per head to producers, Jan. 1	Dairy cattle on farms and elsewhere [1]
	Thous.	*Dolls.*	*Thous.*		*Thous.*	*Dolls.*	*Thous.*
1850, June 1 [2] (census)	6,385		10,100	1898	15,841	27.45	26,400
1860, June 1 [2] (census)	8,586		13,500	1899	15,990	29.66	26,800
1867	8,349	28.74	12,000	1900, June 1 [2] (census)	17,136		
1868	8,692	26.56	12,400	1900	16,292	31.23	27,400
1869	9,248	29.15	13,000	1901	16,834	30.00	26,800
1870, June 1 [2] (census)	8,935			1902	16,697	29.23	26,100
1870	10,096	32.52	14,000	1903	17,111	30.21	26,300
1871	10,023	33.89	14,100	1904	17,420	29.21	26,400
1872	10,304	29.45	14,700	1905	17,572	27.44	26,200
1873	10,576	26.72	15,400	1906	19,794	29.44	29,100
1874	10,705	25.63	15,800	1907	20,968	31.00	30,300
1875	10,907	25.74	16,300	1908	21,194	30.67	30,100
1876	11,085	25.61	16,900	1909	21,720	32.36	30,400
1877	11,261	25.47	17,400	1910, Apr. 15 [2] (census)	20,625		
1878	11,300	25.74	17,700	1910	20,625	35.29	30,000
1879	11,826	21.71	18,900	1911	20,823	39.97	30,200
1880, June 1 [2] (census)	12,443			1912	20,699	39.39	29,900
1880	12,027	23.05	19,500	1913	20,497	45.02	29,400
1881	12,369	23.95	20,100	1914	20,737	53.94	29,600
1882	12,612	25.89	20,500	1915	21,262	55.33	30,300
1883	13,126	30.21	21,300	1916	22,108	53.92	31,300
1884	13,501	31.37	21,900	1917	22,894	59.63	32,300
1885	13,905	29.70	22,600	1918	23,310	70.54	32,700
1886	14,235	27.40	23,100	1919	23,475	78.20	32,800
1887	14,522	26.08	23,600	1920, Jan. 1 [2] (census)	19,675		
1888	14,856	24.65	24,100	1920	[3] 21,427	85.56	32,986
1889	15,299	23.94	24,900	1921	21,408	64.13	32,626
1890, June 1 [2] (census)	16,512			1922	21,788	50.97	32,943
1890	15,953	22.01	25,900	1923	22,063	50.94	33,452
1891	16,020	21.62	26,100	1924	22,255	52.30	33,684
1892	16,416	21.40	26,900	1925, Jan. 1 (census)	17,645		
1893	16,424	21.75	27,000	1925	22,481	50.67	34,047
1894	16,487	21.77	27,100	1926	22,188	57.34	33,257
1895	16,505	21.97	27,300	1927	21,818	62.43	33,013
1896	16,138	22.55	26,800	1928	21,948	77.43	33,604
1897	15,942	23.16	26,500				

Data for milk cows on farms and price paid to producers, except as otherwise stated, from reports of the Bureau of Agricultural Economics, as of Jan. 1. The tentative revisions on "all cattle on farms" for 1900–1919, as shown in Table 333, have not been made on "milk cows on farms." The figures for these years are estimates as made currently.

[1] Data for dairy cattle, including young animals and bulls of that type on farms and elsewhere as of Jan. 1, estimated by the Bureau of Animal Industry, are tentative and subject to revision after more extensive research. Census figures for milk and dairy cows were adjusted to a Jan. 1 basis and to include all ages and all animals in towns, villages, and ranges, as well as on farms. For methods see Department Circular 241 as published in 1922. Some figures revised in a 1926 edition, and additional revisions have been made by the Bureau of Animal Industry for 1920–1928.

[2] Figures for census years 1850–1890 represent "milch cows;" 1900, "cows kept for milk, 2 years and over;" 1910, "cows and heifers kept for milk, born before Jan. 1, 1909" (15½ months and over); 1920 and 1925, "dairy cows and heifers, 2 years old and over, kept for milk." For comparison with 1920 the number of dairy cows and heifers 2 years old and over on Jan. 1, 1910, has been estimated by the Census as 17,125,471.

[3] Beginning with 1920 cows and heifers 2 years old and over kept for milk. Heifers 1–2 years old being kept for milk cows were estimated as follows, 1920–1928, respectively: 4,418,000, 4,155,000, 4,023,000, 4,147,000, 4,137,000, 4,195,000, 3,923,000, 4,048,000, 4,175,000.

TABLE 423.—*Milk cows and heifers: Estimated number on farms and value per head, by States, January 1, 1924–1928*

State	Cows and heifers 2 years old and over kept for milk									
	Number Jan. 1					Value per head Jan. 1				
	1924	1925	1926	1927	1928 [1]	1924	1925	1926	1927	1928 [1]
	Thousands	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
Maine	160	156	150	146	143	56.00	52.00	66.00	67.00	81.00
New Hampshire	86	85	80	77	77	63.00	59.00	72.00	85.00	109.00
Vermont	298	287	288	286	284	57.00	57.00	70.00	79.00	99.00
Massachusetts	157	148	140	136	134	76.00	75.00	90.00	95.00	128.00
Rhode Island	22	22	22	21	20	88.00	80.00	87.00	100.00	136.00
Connecticut	116	118	116	110	109	83.00	78.00	92.00	100.00	134.00
New York	1,422	1,383	1,362	1,318	1,330	65.00	62.00	80.00	90.00	115.00
New Jersey	124	123	123	119	122	85.00	75.00	95.00	110.00	125.00
Pennsylvania	898	889	862	845	855	62.00	61.00	74.00	80.00	103.00
Ohio	964	964	945	926	917	56.00	57.00	64.00	70.00	89.00
Indiana	659	679	672	679	693	55.00	57.00	62.00	64.00	78.00
Illinois	1,029	1,049	1,039	988	968	60.00	59.00	66.00	69.00	79.00
Michigan	847	850	858	841	849	60.00	60.00	64.00	73.00	90.00
Wisconsin	1,981	2,015	2,055	2,014	1,994	58.00	55.00	66.00	74.00	90.00
Minnesota	1,535	1,560	1,560	1,513	1,528	52.00	51.00	59.00	61.00	75.00
Iowa	1,280	1,341	1,341	1,314	1,314	60.00	58.00	63.00	66.00	78.00
Missouri	805	835	827	827	827	46.00	44.00	47.00	50.00	65.00
North Dakota	494	520	530	472	458	47.00	44.00	47.00	50.00	64.00
South Dakota	520	544	539	513	518	50.00	47.00	52.00	55.00	70.00
Nebraska	612	625	625	613	613	56.00	54.00	58.00	60.00	74.00
Kansas	737	760	730	715	701	50.00	49.00	52.00	55.00	66.00
Delaware	34	34	35	35	36	56.00	60.00	65.00	75.00	95.00
Maryland	179	184	182	178	185	63.00	60.00	66.00	70.00	90.00
Virginia	385	393	380	357	364	42.00	40.00	41.00	45.00	60.00
West Virginia	215	225	221	207	219	43.00	40.00	43.00	47.00	67.00
North Carolina	306	312	303	303	321	43.00	40.00	42.00	47.00	62.00
South Carolina	182	176	155	158	160	38.00	36.00	36.00	40.00	49.00
Georgia	366	354	340	343	346	30.00	30.00	30.00	36.00	49.00
Florida	82	70	74	78	78	55.00	54.00	50.00	40.00	50.00
Kentucky	457	473	464	478	511	38.00	37.00	41.00	47.00	62.00
Tennessee	458	462	434	425	446	32.00	31.00	34.00	41.00	57.00
Alabama	370	365	340	350	350	27.00	26.00	29.00	32.00	42.00
Mississippi	433	411	379	379	390	27.00	24.00	28.00	32.00	47.00
Arkansas	378	380	374	375	379	21.00	25.00	28.00	33.00	44.00
Louisiana	205	206	200	210	204	37.00	37.00	34.00	36.00	44.00
Oklahoma	554	582	570	581	610	31.00	34.00	40.00	47.00	58.00
Texas	1,014	985	936	936	936	33.00	33.00	34.00	45.00	60.00
Montana	174	187	190	181	175	53.00	50.00	54.00	54.00	69.00
Idaho	147	160	165	168	170	62.00	50.00	64.00	65.00	77.00
Wyoming	64	66	69	70	72	57.00	50.00	55.00	62.00	76.00
Colorado	217	224	224	240	242	50.00	45.00	50.00	56.00	71.00
New Mexico	63	64	64	64	65	50.00	45.00	46.00	48.00	60.00
Arizona	36	37	32	35	35	85.00	70.00	70.00	80.00	87.00
Utah	84	87	88	89	92	72.00	58.00	68.00	72.00	80.00
Nevada	18	19	20	20	20	83.00	60.00	75.00	80.00	85.00
Washington	275	283	275	275	270	71.00	65.00	66.00	74.00	82.00
Oregon	218	225	214	214	216	61.00	60.00	60.00	65.00	75.00
California	595	579	596	596	602	76.00	73.00	77.00	78.00	83.00
United States	22,255	24,496	22,188	21,818	21,948	52.30	50.67	57.37	62.43	77.43

Bureau of Agricultural Economics. Estimates of the crop-reporting board.

[1] Preliminary.

TABLE 424.—*Purebred dairy cattle: Number registered, by breeds, United States, 1900–1927*

Year	Ayrshire			Guernsey			Holstein-Friesian			Jersey		
	Bulls	Cows	Total	Bulls	Cows	Total	Bulls	Cows	Total	Bulls	Cows	Total
1900				608	896	1,504	1,365	3,381	4,746	2,798	8,750	11,548
1901				647	1,172	1,819	1,460	3,648	5,108	2,567	8,045	10,612
1902				726	1,267	1,993	1,738	4,252	5,990	2,471	7,580	10,051
1903				746	1,289	2,035	2,088	4,753	6,841	2,370	7,240	9,610
1904				737	1,261	1,998	2,477	5,567	8,044	2,373	7,464	9,837
1905				847	1,612	2,459	3,226	6,547	9,773	2,640	7,735	10,375
1906				950	1,964	2,914	3,842	7,918	11,760	3,019	8,652	11,671
1907				1,118	1,966	3,084	4,841	9,809	14,650	3,752	9,383	13,135
1908				1,291	2,191	3,482	5,684	10,850	16,534	4,148	10,135	14,283
1909				1,841	3,836	5,677	7,021	12,570	19,591	5,249	12,513	17,762
1910			3,233	2,420	4,194	6,614	9,689	16,487	26,176	6,333	14,509	20,842
1911			4,798	2,402	4,001	6,403	12,472	20,417	32,889	7,229	16,282	23,511
1912			2,884	2,942	4,578	7,520	13,743	23,792	37,535	7,562	16,591	24,153
1913			3,950	3,653	5,642	9,295	16,364	26,951	43,315	9,147	19,481	28,628
1914			4,912	4,348	6,937	11,285	18,336	29,750	48,086	10,079	22,861	32,940
1915			4,439	4,765	6,535	11,300	25,617	42,063	67,680	9,475	22,957	32,432
1916			4,033	5,030	7,654	12,684	26,116	46,549	72,665	10,242	24,997	35,239
1917			4,944	6,167	9,366	15,533	24,749	49,098	73,847	14,446	33,960	48,406
1918			8,494	6,108	9,356	15,464	28,730	59,549	88,279	8,904	25,398	34,302
1919			6,148	7,648	11,781	19,429	30,298	60,589	90,887	10,906	30,424	41,330
1920			6,809	7,427	11,956	19,383	36,791	77,712	114,503	11,669	32,162	43,831
1921			5,874	8,036	13,971	22,007	39,585	88,265	127,850	11,213	31,123	42,336
1922	1,565	4,816	6,381	8,065	14,007	22,072	30,631	83,141	113,772	11,651	33,801	45,452
1923	1,578	5,975	7,553	9,758	16,976	26,734	29,089	86,043	115,132	12,291	38,159	50,450
1924	1,431	5,508	6,939	10,301	18,166	28,467	28,209	83,320	111,529	12,331	39,832	52,163
1925	1,561	5,972	7,533	11,299	20,742	32,041	26,935	82,659	109,594	12,131	41,725	53,856
1926	1,720	6,142	7,862	12,392	22,298	34,690	28,117	82,971	111,088	12,837	42,915	55,752
1927	1,847	6,554	8,401	12,777	22,694	35,471	28,817	81,146	109,963	15,666	48,411	64,077

Bureau of Agricultural Economics. Obtained from registry associations.

TABLE 425.—*Cattle: Tuberculin testing under accredited herd and area plans, 1917–1927*

Year ended June 30—	Cattle tested					Modified accredited areas	Herds accredited [1]	Herds passed 1 test [1]	Herds under supervision [1]
	Accredited-herd plan	Area plan	Total	Reactors found	Per cent of reactors				
	Number	*Number*	*Number*	*Number*		*Number*	*Number*	*Number*	*Number*
1917	20,101		20,101	645	3.2				
1918	134,143		134,143	6,544	4.9		204	883	
1919	329,878		329,878	13,528	4.1		578	5,652	
1920	700,670		700,670	28,709	4.1		2,588	10,064	
1921	1,366,358		1,366,358	53,768	3.9		4,831	33,215	71,806
1922	1,722,209	[2] 662,027	2,384,236	82,569	3.5		8,015	111,719	140,376
1923	1,695,662	1,765,187	3,460,849	113,844	3.3		12,310	150,748	187,915
1924	1,865,863	3,446,501	5,312,364	171,559	3.2	38	19,747	216,737	305,809
1925	2,008,526	4,991,502	7,000,028	214,491	3.1	51	24,110	392,740	414,620
1926	1,989,048	6,661,732	8,650,780	323,084	3.7	109	24,009	382,674	435,840
1927	2,522,791	7,177,385	9,700,176	285,361	2.9	149	34,084	229,086	261,148
Total	14,355,249	24,704,334	39,059,583	1,294,102	3.3	347	130,476	1,533,518	1,817,514

Bureau of Animal Industry.

[1] The figures in these columns represent net increases at the close of each year.
[2] Testing during 6 months.

TABLE 426.—*Cattle: Status of tuberculosis eradication work, by States, June 30, 1927*

State	Accredited herds	Passed 1-test herds	Under supervision		Eradication from areas [1]					Total tuberculin tests, 1917–June 30, 1927		
			Herds	Cattle	Modified accredited counties	Additional counties having completed 1 or more tests of all cattle	Counties intensively engaged in testing cattle	Total counties engaged	Total cattle tested [2]	Total cattle	Reactors: Number	Reactors: Per cent
Alabama	234	4,198	6,109	60,768	0	0	3	3	2,556	277,596	2,105	0.8
Arizona	29	7,319	7,353	96,795	0	0	14	14	47,531	157,924	5,386	3.4
Arkansas	19	2,886	4,629	22,650	0	0	0	0	0	44,239	316	.7
California	118	4,205	4,329	201,014	2	0	2	4	54,138	302,029	3,240	1.1
Colorado	134	2,336	2,699	24,442	0	0	2	2	6,327	54,181	1,302	2.4
Connecticut	1,255	1,560	3,562	53,686	0	0	4	4	6,136	316,293	30,285	9.6
Delaware	1,473	2,618	4,752	20,010	0	1	0	1		100,681	9,876	9.8
District of Columbia	26	253	286	1,262	0	1	0	1	669	11,943	121	1.0
Florida	412	6,776	7,627	110,669	3	1	0	4		228,871	3,007	1.3
Georgia	36	4,605	4,772	51,184	0	2	1	3	1,873	205,070	2,688	1.3
Idaho	59	26,124	29,398	319,738	15	2	11	28	86,583	496,839	3,651	.7
Illinois	1,208	108,648	122,043	1,088,262	7	0	64	71	685,318	2,646,537	146,975	5.6
Indiana	28,653	76,501	111,297	757,115	21	10	24	55	271,803	1,453,461	23,582	1.6
Iowa	7,377	81,484	140,156	2,401,814	30	16	13	59	676,562	4,104,778	112,497	2.7
Kansas	978	47,770	49,581	572,700	20	4	0	24	225,745	850,446	9,527	1.1
Kentucky	59	60,804	61,148	439,999	6	30	12	48	75,685	484,125	5,313	1.1
Louisiana	28	5,403	5,751	65,516	0	0	0	0	0	237,670	5,908	2.5
Maine	5,319	25,959	32,491	204,452	4	0	12	16	65,930	465,962	6,031	1.3
Maryland	4,058	8,387	19,129	126,882	0	3	5	8	75,839	493,046	36,657	7.4
Massachusetts	480	1,314	2,727	36,616	0	0	0	0	0	195,752	28,763	14.7
Michigan	89	121,279	125,964	969,489	42	13	6	61	511,255	2,266,487	46,986	2.1
Minnesota	8,260	37,948	48,165	971,550	9	8	0	17	681,422	2,685,481	67,381	2.5
Mississippi	88	3,765	3,853	42,964	0	1	2	3	32,771	216,567	1,049	.5
Missouri	950	58,184	61,572	567,827	4	0	3	7	14,761	803,353	6,865	.9
Montana	90	25,939	26,561	437,525	[3] 2	1	2	[3] 5	60,697	661,684	6,199	.9
Nebraska	110	48,613	49,341	628,209	21	6	7	34	370,532	1,416,212	20,216	1.4
Nevada	10	1,003	1,203	23,042	0	0	13	13	15,390	104,869	1,725	1.6
New Hampshire	2,517	2,525	5,144	60,102	0	0	5	5	24,838	257,988	17,480	6.8
New Jersey	1,357	2,453	3,990	21,562	0	0	0	0	0	251,860	16,953	6.7
New Mexico	13	165	178	9,935	0	0	18	18	871	41,791	195	.5
New York	36,415	41,703	94,571	981,708	4	9	32	45	644,950	2,895,690	292,664	10.1
North Carolina	318	227,832	228,431	601,468	82	0	12	94	89,873	686,442	3,660	.5
North Dakota	4,486	34,635	43,693	756,217	19	0	13	32	107,969	1,213,376	17,467	1.4

klahoma	229	136	385	13, 835	0	0	0	0	0	176, 002	3, 617	2. 1
regon	419	23, 516	23, 964	166, 740	4	6	14	24	113, 241	814, 531	10, 589	1. 3
ennsylvania	4, 081	73, 032	90, 297	629, 958	9	5	35	49	269, 080	1, 506, 545	78, 370	5. 2
hode Island	46	83	246	4, 431	0	0	0	0	0	21, 634	3, 095	14. 3
outh Carolina	151	24, 360	24, 584	75, 009	3	0	1	4	29, 315	167, 331	1, 372	. 8
outh Dakota	824	8, 228	9, 340	179, 840	3	1	0	4	110, 977	489, 785	10, 835	2. 2
ennessee	319	19, 363	19, 823	122, 484	3	0	0	3	12, 595	327, 320	2, 211	. 7
exas	180	76	319	17, 048	0	0	0	0	0	234, 427	2, 806	1. 2
tah	97	10, 516	11, 512	91, 838	1	1	21	23	62, 551	336, 619	3, 482	1. 0
ermont	4, 595	2, 739	10, 387	161, 385	(4)		6	6	30, 886	770, 308	35, 563	4. 6
irginia	2, 166	8, 959	11, 384	112, 108	4	1	5	10	24, 623	472, 476	11, 011	2. 3
ashington	65	32, 877	34, 636	380, 832	0	2	33	35	131, 067	754, 553	16, 698	2. 2
est Virginia	968	22, 065	23, 391	138, 510	5	2	3	10	48, 860	268, 253	4, 142	1. 5
isconsin	9, 029	99, 998	113, 136	1, 798, 034	11	30	19	60	1, 055, 295	4, 077, 583	115, 676	3. 0
yoming	5	7, 741	8, 880	102, 191	0	0	0	0	0	121, 809	982	. 8
dian schools [5]										413	27	6. 5
urebred herds in United States [5]										4, 486	157	3. 5
awaii			1, 635	49, 264						49, 264	1, 062	2. 2
iterstate testing										440, 958	3, 210	. 7
Total	130, 476	1, 533, 518	1, 817, 514	17, 600, 380	347	164	443	954	7, 177, 385	39, 059, 583	1, 294, 102	3. 3

ndustry.

[1] Accredited-herd work begun 1917; area work, 1921.
[2] Includes area work in units smaller than counties.
[3] Part of 1 county.
[4] 14 towns.
[5] Testing in 1917 before work was organized by States.

TABLE 427.—*Milk cows: Estimated price*[1] *per head received by producers, 15th of month, United States, 1910–1927*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
Average:	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*	*Dolls.*
1910–1913	44.57	44.91	46.32	46.88	46.84	47.09	46.38	46.48	46.87	47.42	47.78	47.98	47.99
1914–1920	70.75	71.54	72.71	74.12	74.86	75.15	75.08	74.60	74.48	74.43	72.73	72.30	73.56
1921–1925	56.81	56.28	57.52	57.54	57.51	57.07	56.08	55.59	55.49	55.25	55.21	56.11	56.29
1910	41.18	40.35	41.75	42.22	42.38	43.46	42.86	42.77	42.68	43.20	43.34	43.41	42.47
1911	44.70	44.48	45.42	44.81	44.54	43.86	42.44	42.26	42.22	42.69	42.70	42.72	43.57
1912	42.89	43.40	44.09	45.14	45.63	45.84	45.41	46.11	46.79	47.30	47.38	48.62	45.72
1913	49.51	51.42	54.02	55.34	54.80	55.20	54.80	54.78	55.78	56.47	57.71	57.19	54.75
1914	57.99	59.09	59.23	59.60	59.85	59.82	59.67	60.72	59.58	59.53	58.77	58.23	59.34
1915	58.47	57.99	58.00	57.78	58.29	58.59	60.31	58.34	58.38	58.76	57.35	56.79	58.25
1916	57.79	57.99	59.51	60.68	60.98	61.63	62.04	61.32	61.41	62.19	62.67	63.18	60.95
1917	63.92	65.93	68.46	72.09	72.78	72.87	72.81	72.53	73.93	75.79	75.00	76.16	71.86
1918	76.54	78.36	80.71	82.45	84.11	84.74	84.97	84.06	85.21	85.41	84.51	85.78	83.07
1919	86.10	86.15	88.15	90.91	93.43	93.84	94.51	94.72	93.42	93.43	93.27	95.54	91.96
1920	94.42	95.27	94.94	95.36	94.56	94.56	91.23	90.50	89.40	85.90	77.56	70.42	89.51
1921	66.82	63.44	65.37	64.35	62.63	59.89	56.55	55.85	54.33	53.39	53.28	53.30	59.10
1922	52.83	53.54	54.87	54.46	54.76	54.87	54.20	52.67	52.79	52.86	51.62	53.21	53.56
1923	54.01	54.15	55.29	56.14	55.91	56.34	56.22	55.45	56.13	55.51	55.39	54.66	55.43
1924	55.57	55.49	55.88	55.92	56.37	56.45	55.40	55.74	55.54	54.30	55.05	54.00	55.48
1925	54.81	54.79	56.19	56.85	57.88	57.79	57.95	58.26	58.68	60.17	60.69	60.38	57.87
1926	62.06	63.41	63.17	65.65	66.63	66.74	66.68	65.37	66.12	66.26	66.91	66.74	65.51
1927	66.77	68.22	70.18	71.98	72.43	74.19	74.15	74.24	76.10	78.62	81.09	82.36	74.19

Bureau of Agricultural Economics.

[1] As reported by country dealers.

TABLE 428.—*Milk: Production and utilization, United States, 1921–1925*

Purpose for which milk is used	Milk used per pound of product	1922			1923			1924			1925			1926		
		Product manufactured	Whole milk used	Per cent of total milk	Product manufactured	Whole milk used	Per cent of total milk	Product manufactured	Whole milk used	Per cent of total milk	Product manufactured	Whole milk used	Per cent of total milk	Product manufactured	Whole milk used	Per cent of total milk
	Pounds	*1,000,000 pounds*	*1,000,000 pounds*	*Per cent*	*1,000,000 pounds*	*1,000,000 pounds*	*Per cent*	*1,000,000 pounds*	*1,000,000 pounds*	*Per cent*	*1,000,000 pounds*	*1,000,000 pounds*	*Per cent*	*1,000,000 pounds*	*1,000,000 pounds*	*Per cent*
Butter:																
Creamery	21.0	1,153.5	24,223.8	23.619	1,252.2	26,296.5	23.963	1,356.1	28,577.7	24.923	1,361.0	28,592.1	24.541	1,451.8	30,487.1	25.245
Farm	21.0	625.0	13,125.0	12.797	610.0	12,810.0	11.673	600.0	12,600.0	10.988	590.0	12,390.0	10.635	615.0	12,915.0	10.694
Cheese, all kinds	10.0	375.0	3,749.8	3.656	398.9	3,989.5	3.636	417.9	4,179.4	3.645	447.0	4,475.2	3.841	427.4	4,274.2	3.539
Milk:																
Condensed and evaporated	2.5	1,431.3	3,573.4	3.489	1,774.9	4,437.2	4.044	1,700.5	4,251.4	3.708	1,157	4,394.7	3.772	1,733.5	4,333.8	3.589
Powdered	8.0	5.6	44.8	.044	6.6	52.5	.048	7.9	63.1	.055	8.0	71.4	.061	10.8	86.1	.071
Malted	2.2	13.7	30.0	.029	15.3	33.7	.031	15.9	34.9	.031	18.0	39.7	.034	20.7	45.5	.038
Sterilized, canned	1.0	.3	.3	----------	.1	.1	----------	.5	.5	----------	1.0	1.6	.002	1.3	1.3	.001
Chocolate	----------	----------	100.0	.098	----------	149.5	.136	----------	158.8	.138	----------	228.8	.196	----------	171.5	.142
Cream, powdered	19.0	.1	2.2	.002	.3	6.2	.006	1.0	19.3	.017	.3	6.4	.006	.3	6.3	.005
Ice cream	[1] 13.75	[2] 263.5	3,623.4	3.533	[2] 294.9	4,054.9	3.695	[2] 285.6	3,926.3	3.424	322.0	4,437.5	3.809	324.7	4,464.1	3.698
Total milk for manufacture	----------	----------	48,477.7	47.267	----------	51,830.1	47.232	----------	53,811.4	46.929	----------	54,637.4	46.897	----------	56,784.9	47.020
Milk accounted for otherwise:																
Household purposes	----------	----------	46,672.6	45.507	----------	50,440.0	45.965	----------	52,772.0	46.022	----------	54,325.8	46.629	----------	56,417.0	46.716
Fed to calves	----------	----------	4,335.0	4.226	----------	4,174.0	3.803	----------	4,642.8	4.049	----------	4,047.1	3.474	----------	3.941.6	3.264
Waste, loss, and unspecified	----------	----------	3,076.9	3.000	----------	3,292.0	3.000	----------	3,440.0	3.000	----------	3,495.1	3.000	----------	3.623.0	3.000
Total milk produced	----------	----------	102,562.2	100.000	----------	109,736.1	100.000	----------	114,666.2	100.000	----------	116,505.4	100.000	----------	120,766.5	100.000

Bureau of Agricultural Economics. The compilations are made from reports of factories, reports of municipal boards of health, reports of large milk distributors, feeding tests, and special reports of experimental stations or farms. Reports of the Bureau of the Census were also used in estimating farm butter and in the checking of various other compilations.

[1] Milk per gallon of ice cream.

[2] 1,000,000 gallons.

TABLE 429.—*Dairy products: Quantity produced, 1921–1926*

Product	1921	1922	1923	1924	1925	Tota	1926											
							January	February	March	April	May	June	July	August	September	October	November	December
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Creamery butter	1,054,938	1,153,515	1,252,214	1,356,080	1,361,526	1,451,766	97,893	94,222	112,432	121,049	155,912	178,276	159,554	133,294	116,732	103,068	88,481	90,853
Whey butter (made from whey cream)	2,176	2,291	1,904	1,665	1,774	2,872	95	88	113	480	628	704	176	159	135	118	93	83
Renovated or process butter	5,877	4,448	2,802	2,813	2,519	2,505	136	182	185	130	237	181	138	249	269	185	244	369
Butter oil				1,130	837	217	1	1		25	29	32	28	27	24	16	16	18
American cheese:																		
Whole milk	261,727	282,806	308,108	324,695	347,240	335,915	19,519	19,984	25,216	29,221	38,598	46,320	40,164	33,239	28,809	23,164	16,386	15,295
Part skim	1,455	2,164	2,145	2,470	2,793	2,927	172	163	238	335	405	476	285	211	161	148	148	185
Full skim	1,733	2,500	2,033	1,605	3,298	1,384	58	68	110	117	133	159	133	107	97	166	123	113
Swiss cheese (including block)	22,678	19,983	24,555	21,844	23,457	20,883	189	175	252	847	3,128	4,035	3,749	3,231	2,635	1,627	795	220
Brick and Munster cheese	42,073	37,194	33,250	32,052	34,101	31,048	2,530	2,300	2,880	3,330	3,060	2,958	2,316	2,067	2,065	2,608	2,483	2,451
Limburger cheese	7,035	7,383	7,100	9,734	9,163	9,639	407	377	598	973	1,367	1,508	1,030	864	736	785	554	440
Cream and Neufchatel cheese	9,279	9,936	10,334	14,945	17,575	18,192	1,701	1,600	1,771	1,519	1,451	1,358	1,204	1,205	1,198	1,636	1,748	1,801
All Italian varieties of cheese	3,793	2,627	2,132	1,973	1,562	2,425	140	143	209	255	305	363	196	158	167	168	156	165
All other varieties of cheese	6,065	5,387	5,040	4,622	4,325	5,003	400	381	453	384	432	468	445	397	492	410	372	369
Total cheese (not including cottage, pot, and baker's)	355,838	369,980	394,697	413,940	443,514	427,416	25,116	25,191	31,727	36,981	48,879	57,645	49,522	41,479	36,360	30,712	22,765	21,039
Cottage, pot, and baker's cheese	27,316	32,389	35,527	54,347	59,485	67,977	5,332	5,371	6,510	6,829	6,923	6,997	5,556	4,661	4,550	5,155	4,875	5,218
Condensed milk (sweetened):																		
Case goods—																		
Skimmed	3,861	3,915	2,748	2,044	3,135	1,298	58	173	76	160	59		26	135	45	37	237	292
Unskimmed	199,985	230,456	196,058	187,281	186,807	154,944	13,592	10,491	12,631	14,640	18,223	17,618	12,976	11,033	10,610	10,834	10,402	11,894
Bulk goods—																		
Skimmed	66,051	76,049	102,236	96,581	114,198	147,473	11,006	10,354	12,149	14,051	19,247	22,169	14,241	10,226	10,436	9,428	6,721	7,445
Unskimmed	22,324	30,292	44,860	47,429	44,758	55,737	5,579	5,249	5,821	4,274	7,052	7,871	6,069	4,439	3,787	2,744	1,499	1,353
Evaporated milk (unsweetened):																		
Case goods—																		
Skimmed	1,405	3,574	7,035	11,555	5,994	11,985	10	14	13	2,614	2,436	2,517	662	8	111	1,367	1,153	1,080
Unskimmed	1,028,172	949,909	1,252,520	1,189,755	1,202,456	1,158,476	84,548	79,745	101,166	111,587	136,815	157,478	124,524	90,406	77,401	70,573	57,674	66,559
Bulk goods—																		
Skimmed	69,220	67,066	77,416	83,131	86,954	116,758	5,382	5,159	7,929	9,972	12,943	14,223	16,086	12,791	9,790	9,142	7,312	6,029
Unskimmed	73,145	70,088	92,008	82,772	113,556	86,833	4,374	4,453	5,342	7,017	10,468	11,267	12,974	10,323	7,078	5,351	4,064	4,122
Total condensed and evaporated milk	1,464,163	1,431,349	1,774,881	1,700,548	1,757,858	1,733,504	124,549	115,638	145,127	164,315	207,243	233,143	187,558	130,361	119,258	109,476	89,062	98,774

Sterilized milk (canned same as condensed)	5,074	330	80	488	1,576	1,286	122	88	95	208	268	262	15	100	123	1	3	1
Condensed or evaporated buttermilk	29,314	44,343	54,833	66,837	77,079	86,687	6,474	5,956	6,962	7,002	8,497	10,838	9,100	7,478	7,004	6,359	5,847	5,170
Dried or powdered buttermilk	7,708	9,007	13,032	18,058	20,246	31,378	2,180	2,254	2,799	2,581	3,169	3,602	3,118	2,728	2,511	2,276	1,853	2,307
Powdered whole milk	4,242	5,599	6,560	7,887	8,931	10,768	852	580	1,087	1,127	1,305	1,845	1,172	595	549	644	399	613
Powdered skimmed milk	38,546	40,617	62,251	69,219	73,317	91,718	5,400	5,647	7,755	9,052	11,042	12,118	10,100	7,907	6,924	5,941	5,037	4,795
Powdered cream	130	118	328	1,018	339	331	12	5	23	45	57	139	16	8	-------	13	7	6
Dried casein (skim-milk product)	8,066	6,907	14,500	20,683	16,468	16,893	966	1,028	1,475	1,618	2,041	2,611	1,742	1,291	1,130	1,087	944	960
Dried casein (buttermilk product)	10	20	48	76	192	60	-------	17	-------	1	1	1	31	-------	-------	-------	-------	9
Malted milk	15,652	13,659	15,331	15,889	18,050	20,673	1,596	1,741	1,948	1,952	2,044	2,115	1,804	1,561	1,489	1,423	1,400	1,600
Milk sugar (crude)	2,890	2,191	2,872	3,331	5,655	4,476	157	224	325	647	730	805	414	297	269	227	182	199
Ice cream of all kinds (gallons)	147,949	161,609	183,412	181,564	214,382	215,248	8,054	8,682	11,477	14,902	24,914	27,885	36,714	32,129	20,418	12,982	9,258	7,833
Ice cream mix or *stock*	---------	---------	---------	41,912	68,051	102,403	2,783	2,856	4,022	10,359	18,533	20,031	13,622	12,201	6,677	4,378	3,644	3,297

Bureau of Agricultural Economics. Compiled from reports of factories made direct to the bureau.

TABLE 430.—*Condensed milk: International trade, average 1909–1913, annual 1924–1926*

Country	Year ended Dec. 31							
	Average 1909–1913		1924		1925		1926, preliminary	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
PRINCIPAL EXPORTING COUNTRIES	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Australia	4,463	727	[1] 79	[1] 12,726	[1] 67	[1] 25,552	[2] 348	[2] 25,905
Canada	259	4,575	155	40,251	119	40,614	152	24,775
Denmark	[2 3] 5	[3] 4,724	[2] 34	70,806	56	58,762	2	56,734
Irish Free State	------	------	2,368	2,705	2,442	6,569	1,659	9,169
Italy	806	5,913	855	13,560	771	17,321	715	11,073
Lithuania	------	------	24	[2] 946	[2] 1	1,958	[2] 62	5,782
Netherlands	[2] 23	55	236	233,901	291	248,674	389	293,046
New Zealand	261	132	31	1,408	93	1,144	7	1,225
Norway	3	32,106	685	13,311	1,173	16,848	1,055	24,483
Switzerland	201	80,539	120	58,255	68	67,555	71	73,940
United States	------	[3] 16,200	6,452	206,280	6,964	147,763	4,152	114,549
PRINCIPAL IMPORTING COUNTRIES								
Algeria	[2] 143	[2] 38	2,759	45	3,047	66	[2] 2,725	[2] 229
Argentina	742	------	946	13	1,187	5	1,524	13
Austria	[2 4] 323	[2 4] 79	4,340	507	1,154	27	1,358	64
Belgium	(5)	(5)	[2] 3,878	390	4,318	1,096	3,368	1,311
Brazil	8,694	------	1,426	[2] 8	761	(6)	1,838	------
British India	11,236	------	10,029	362	[7] 14,124	------	[7] 18,980	------
China	4,484	------	9,461	------	10,117	------	11,994	------
Cuba	28,457	------	47,312	------	47,316	------	48,567	------
Czechoslovakia	------	------	2,141	665	759	1,138	421	640
Dutch East Indies	[8] 13,049	89	17,677	------	20,009	77	[9] 10,709	------
Egypt	[10] 1,628	------	1,740	160	1,173	253	1,339	289
France	2,458	4,140	20,168	4,916	17,369	4,803	15,750	8,338
French Indo-China	[2] 2,437	[2] 72	[2] 5,006	[2] 164	4,371	187	5,958	250
Germany [11]	66	12,080	26,753	570	28,372	1,428	12,036	1,681
Greece [2]	176	------	5,359	1	5,359	------	------	------
Jamaica [2]	2,860	------	3,427	------	3,387	------	3,803	------
Japan	10,061	------	12,642	74	9,429	276	9,641	204
Peru	[2 8] 2,038	------	7,097	------	9,339	------	8,886	------
Philippine Islands	12,311	------	17,890	------	22,533	------	24,142	------
Poland	------	------	2,972	31	442	128	79	2
Siam	------	------	[2] 3,283	------	4,833	------	4,788	------
Trinidad and Tobago	[2] 37	------	[2] 2,146	[2] 101	2,383	[2] 136	2,836	------
Tunis	[2 3] 1,334	------	1,950	------	1,844	------	1,828	------
Union of South Africa	21,227	(6)	10,029	1	9,922	16	11,122	16
United Kingdom	121,175	48,221	245,486	11,113	250,572	14,497	269,682	14,287
Total, 36 countries	250,957	209,690	477,956	673,240	486,160	656,893	481,986	688,005

Bureau of Agricultural Economics. Official sources, except where otherwise stated.

[1] Year ended June 30.
[2] International Yearbook of Agricultural Statistics.
[3] 4-year average.
[4] Average for Austria-Hungary.
[5] Not separately stated.
[6] Less than 500 pounds.
[7] Sea trade only.
[8] 3-year average.
[9] Java and Madura only.
[10] 1 year only.
[11] Includes some powdered milk.

TABLE 431.—*Milk, standard or grade B: Retail price per quart, delivered to family trade in cities, 1920–1927*

Market and year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Boston:	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1920	17	17	17	17	16	16	17	17½	18	18	18	18
1921	17	16½	16	15½	15	15	15	16	15½	15	15	15
1922	13½	13½	13½	13½	12½	12½	13½	13½	13½	14½	14½	14½
1923	14½	14½	14½	13½	13½	13½	14	14½	14½	14½	15½	15
1924	14½	13½	12½	12	12	12	12½	13½	14½	14½	14½	14½
1925	14½	14½	13½	13½	13½	13	14	14½	14½	14½	14½	14½
1926	14½	14½	14½	14½	14½	13½	14½	14½	14½	14½	14½	15
1927	14	14	14	14	14	14	14	15	15½	15½	15½	16½
New York.												
1920	18	16½	16½	15	15	15	16	17	18	18	18	17
1921	17	16	15	------	------	14	14	15	15	15	15	15
1922	15	15	15	------	13	13	14	15	15	15	15	16
1923	16	15	15	15	14	14	14	14	15	15	16	15
1924	15	14	14	14	13	13	13	13	14	14	15	15
1925	15	15	15	15	15	14	14	15	15	15	15	15
1926	15	15	15	15	15	15	15	15	15	15	15	15
1927	15	15	15	15	15	15	15	15	16	16	16	16
Philadelphia:												
1920	14	14	14	14	14	14	14	15	15	15	15	13
1921	13	13	13	13	11	11	11	11	11	11	11	11
1922	11	11	11	11	11	11	11	11	11	12	12	12
1923	11½	12	12	12	13	13	13	13	13	13	12	12
1924	12	12	12	12	12	12	12	12	12	12	12	12
1925	12	12	12	12	12	12	12	12	12	12	12	12
1926	12	12	12	12	12	12	12	12	12	13	13	13
1927	13	13	13	13	13	13	13	13	13	13	13	13
Pittsburgh:												
1920	16	16	16	15	15	15	15	16	16	16	16	16
1921	15	15	14	14	14	14	14	------	14	14	14	13
1922	13	12	12	12	12	12	12	12	------	------	14	14
1923	------	------	14	14	14	14	14	14	14	15	15	15
1924	15	14	14	14	14	14	14	14	14	14	14	14
1925	14	14	14	14	14	14	14	14	14	14½	14½	14½
1926	14½	14½	14½	14	13	13	13	14	14	14	14½	15
1927	15	15	15	14	14	14	14	14	14	15	15	15
Cleveland:												
1920	16	16	16	15	15	15	15	16	16	16	15	15
1921	15	14	14	14	14	13	13	13	13	13	13	13
1922	11	11	11	10	10½	10½	10½	11	11	13	13	14
1923	14	14	14	14	13½	13	14	14	14	13½	14	13½
1924	13½	14	13½	13½	14	12	11	14	13½	13½	13½	13½
1925	13½	13½	14	14	14	14	13½	14	14	14	14	15
1926	15	15	13½	14	14	14	14	14	14	14½	14½	14
1927	14½	14½	14½	14½	14	14	14½	14	14	14	14	14
Indianapolis:												
1920	14	14	14	14	14	14	14	14	14	14	14	14
1921	14	14	13	13	13	12	------	12	12	12	11½	11
1922	11½	11	11	10½	10½	10	10	10	10	------	10	10
1923	10	12	12	12	12	12	------	12	------	12	12	12
1924	12	12	12	12	12	12	12	12	12	11	12	12
1925	12	11	10	10	10	10	10	11	12	12	12	12
1926	12	12	12	12	12	12	12	12	12	12	12	12
1927	12	12	12	12	12	12	12	12	12	12	12	12
Chicago:												
1920	15	15	14	14	14	14	15	16	16	16	15	14
1921	14	14	14	14	14	14	14	14	12	12	12	12
1922	12	12	12	12	12	12	12	12	12	12	12	12
1923	12½	13	13	13	13	13	14	14	14	14	14	14
1924	14	14	14	14	14	14	14	14	14	14	14	14
1925	14	14	14	14	14	14	14	14	14	14	14	14
1926	14	14	14	14	14	14	14	14	14	14	14	14
1927	14	14	14	14	14	14	14	14	14	14	14	14
Detroit:												
1920	16	16	16	16	15½	15½	16	16	16	16	16	14
1921	13	13	13	13	13	13	13	13	13	13	13	13
1922	13	13	12	11½	11½	11½	12	13	13	13	13	14
1923	13½	13½	14	14	14	14	12	15	13½	15	14	13½
1924	14	14	14	14	14	13½	14	13½	13½	13½	13½	13½
1925	13½	13	13½	13	13½	13½	13½	15	14	13½	13½	14
1926	14	14	14	14	14	14	14	14	14	14	14	14
1927	14	14	14	14	14	14	14	13½	13½	13½	14	14
Milwaukee:												
1920	13	13	12	12	12	12	13	13	13	13	11	11
1921	------	10	10	10	9	9	9	10	9	9	9	9
1922	9	9	9	9	9	9	9	9	9	9	10	10
1923	10	10	10	10	10	10	10	11	11	11	11	11
1924	11	11	11	11	11	11	11	11	11	10½	10	10
1925	10	10	10	10	10	10	10	10	10	10	10	10½
1926	10	10	10	11	11	11	11	11	11	11	11	11
1927	11	11	11	11	11	11	11	11	11	11	11	11

TABLE 431.—*Milk, standard or grade B: Retail price per quart, delivered to family trade in cities, 1920–1927*—Continued

Market and year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
Minneapolis:												
1920	13	13	13	13	13	13	13	14	14	14	14	14
1921	13	12½	12	12	11	10	10	11	11	11	11	10½
1922	10	10	10	10	10	10	10	10	11	11	11	11½
1923	11	11	11	11	11	11	11	12	12	12	12	12
1924	12	12	12	10	10	10	10	11½	11	11	11	11
1925	11	11	11	11	11	11	11	11	12	12	12	12
1926	12	11	11	11	11	11	11	11	11	11	11	11
1927	10	11	11	11	11	11	11	11	11	12	12	12
St. Louis:												
1920	16	16	16	15	15	15	15	16	16	16	16½	16
1921	16	15	14	14	14	13	13	13	13	13	13	10
1922	10	10	10	10	10	10	12	12	12	12	12	13
1923	13	13	13	13	13	13	13	13	13	13	13	13
1924	13	13	13	13	13	13	13	13	13	13	13	13
1925	13	13	13	13	13	13	13	13	13	13	13	13
1926	13	13	13	13	13	13	13	13	13	13	13	13
1927	13	13	13	13	13	13	13	13	13	13	13	13
Kansas City, Mo.:												
1920	15½	15½	16	16	15½	15½	15	15½	15	15½	15½	15½
1921	14½	14	13½	13½	13½	13	14	14	14	14	14	14
1922	14	13	12	11	11	11½	11½	12	10	12	12	12½
1923	13	13	13	13	------	13	13	13	13	13	13	13
1924	12	13	13	13	------	13	13	13	13	13	13	13
1925	13	13	13	13	13	13	13	13	13	13	13	13
1926	13	13	13	13	13	13	13	13	13	13	13	13
1927	13	13	13	13	13	13	13	13	13	13	13	13
Washington, D. C.:												
1920	18	17½	17½	17½	16	16	16	16	16½	17½	17½	17½
1921	16½	15	16	16	13	13½	13½	13½	14	15	15	15
1922	13½	13	13	13½	13	13	13	13	13	14	14	14
1923	14	14	14	14	14	14	14	14	14	14	15	15
1924	15	15	15	15	14	14	14	14	14	14	14	14
1925	14	14	14	14	14	14	14	14	14	15	15	15
1926	15	15	15	15	14	14	14	14	14	15	15	15
1927	15	15	15	15	15	15	15	15	15	15	15	15
Jacksonville:												
1920	20	20	20	20	20	20	25	25	25	24	22½	22½
1921	------	18	18	------	------	20	------	19	20	20	18½	18½
1922	17½	------	17	14	14	14	16½	15½	17	16½	17	17
1923	17½	17½	18½	16	15½	15½	16½	16	17	18½	18	17½
1924	19	20	------	17½	16½	17	17	17	18½	18½	18½	18½
1925	18½	18½	18½	19	18½	18	17½	17½	18½	20½	20½	20½
1926	20	20½	20½	20½	20½	19½	19½	19½	20½	20½	20½	20½
1927	20½	20½	20½	19½	19	18½	18½	18½	18½	19	18½	18½
Louisville:												
1920	16	------	16	16	16	16	16	16	16	16	16	------
1921	15	20	------	------	------	------	11	12	11	11	11	11
1922	11	9	9	9	9	9	9	10	11	11½	12	13
1923	13	12	12	12	12	12	12	12½	12½	13	13	13
1924	13	13	13	13	12	12	12	12	12	12	13	13
1925	13	13	12	12	12	12	12	12	12	14	14	14
1926	14	13	12	12	12½	12	12	12	12	12	13	13
1927	13	13	13	13	12	12	12	12	12	12½	13	13
Birmingham:												
1920	21½	20	20	20	23	20	20	22½	22½	20	20	22½
1921	22½	22½	------	20	------	18	20	17½	17½	17½	17½	17½
1922	20	18	------	17½	15	16	------	17½	------	------	16	------
1923	17	16	17	16	16	16	16	16	16	16	15	15
1924	15	17	17	17	17	16	17	16½	16½	18	18	18
1925	18	18	18	18	------	18	18	18	18	18	------	17½
1926	18	------	17½	18	18	18	18	18	18	18	18	18
1927	17	17	17	17	17	17	17	17	17	17	17	17
New Orleans:												
1920	19	19	19	19	17	17	17	17	19	19	19	18
1921	17	17	16	16	16	16	16	16	16	16	14	14
1922	14	14	14	14	14	14	14	14	------	14	14	14
1923	14	------	14	14	14	14	14	14	14	15	15	------
1924	------	15	15	15	14	14	14	14	14	14	14	14
1925	14	14	14	14	12	12	12	12	12	14	14	14
1926	14	14	14	14	14	14	14	14	14	14	14	14
1927	14	14	14	14	14	14	14	14	14	14	14	14
Dallas:												
1920	------	23	23	21	21	21	21	21	21	21	21	21
1921	------	19	17	------	15	------	15	------	15	------	------	15
1922	15	15	12	12	12	12	15	15	15	15	15	15
1923	15	15	15	15	15	15	15	15	------	------	15	15
1924	15	15	15	15	15	15	15	15	15	15	15	15
1925	15	15	15	15	15	15	15	15	15	15	15	15
1926	15	15	14½	12	12½	12½	11½	12	12	12	12	13
1927	13	13	13	13	13	11	11	13	12	12	13	12

TABLE 431.—*Milk, standard or grade B: Retail price per quart, delivered to family trade in cities, 1920–1927*—Continued

Market and year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Butte:	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1920	15	15	15	------	15	15	15	15	------	15	15	15
1921	15	15	15	------	13	------	12½	12½	12½	13	13	12½
1922	12½	13	12½	12	12½	11½	11½	12	12	12	13	12½
1923	12	12½	13	12½	12½	12	12½	12½	13½	13	13	14
1924	------	13	13½	13	13½	13½	13½	13½	13½	13	13	13½
1925	12½	14	13½	13½	13½	13	14	14	13	13½	13½	13
1926	13	13	13½	13	13½	13	------	13	13	13½	13	13
1927	13	------	13	13	13	13	------	13	13	13	13	13
Denver:												
1920	12½	12½	13	13	------	13	13	13	13	13	13	13
1921	13	13	13	12	11	11	11	11	10	10	10	10½
1922	10	10	9½	10	10	9½	10	10	9½	10	10	12
1923	12	12	12	12	12	12	12	12	12	12	12	12
1924	12	12	12	12	12	11	12	12	12	12	12	12
1925	12	12	10	10	10	10	10	12	12	12	12	12
1926	12	12	12	12	------	12	12	12	12	12	12	12
1927	------	12	12	12	12	12	12	12	12	12	12	------
Salt Lake City:												
1920	12½	12½	12½	12½	12½	12½	13	12½	12½	12½	12½	12½
1921	12½	12½	12½	12½	12½	12½	12½	12½	12½	12½	12½	12½
1922	10	8½	.9	9	8½	8½	8½	8½	------	9	8½	9
1923	10½	10	10	------	10	------	------	10½	9½	10	10	10
1924	9½	9½	9½	9½	9½	9½	9½	------	9½	11	10½	10½
1925	10½	10½	10½	11	11	10½	10½	11	10½	10½	10½	10½
1926	10½	10½	10½	9½	9½	9½	10½	10½	10½	11½	10½	10½
1927	10½	9½	10	10	------	------	10	11	11	11	11	11
Seattle:												
1920	14	14½	13½	12	------	13	14	14	14	14	------	13
1921	13	11	13	13	12	------	------	12	------	12	12	11
1922	13	13	13	12	12	12	12	13	13	12½	13	13
1923	13	13	13	13	12	12	12	12	13	13	13	11
1924	------	13	------	12	11	11	11	11	11	9	9	10
1925	10	12	12	12	12	12	12	12	13	13	13	13
1926	12	13	13	------	------	13	13	13	13	------	11	------
1927	12	------	12	12	12	12	12	12	12	11½	12	12
Portland, Oreg.:												
1920	15	15	15	13	13½	13	13	14	14	14	14½	14½
1921	14	14	14	------	13	12	12	12½	12½	12½	12	12
1922	12	11	11	------	11	11	11	12	12	12	12	12
1923	12½	12	12½	12	12	·12	13	12	12	12½	12	12
1924	12	11½	11	11	11	11	------	12	11½	11	11	10½
1925	11	11	11	11	11	11½	11	11½	11½	12	12	12
1926	12	12	12	12½	12	12	12	12	12	11½	12	12½
1927	11½	12	12	12	12	12	12	------	12	12	------	------
Los Angeles:												
1920	16	16	16	16	16	16	18	18	18	18	18	18
1921	18	16	16	16	------	16	15	14	14	14	14	14
1922	14½	14	14	14	14	14	14	14	14	14	15	15
1923	15	15	15	15	15	15	15	15	15	15	15	15
1924	15	15	------	16	15	15	17	15	17	17	14	14½
1925	14	14½	15	15	15	15	15	15	15	15	15	15
1926	15	15	15	15	15	15	15	15	15	15	15	15
1927	15	15	15	15	15	15	15	15	------	15	15	15
San Francisco:												
1920	16	16	15½	15	16	10	15½	17	17	17	17	17
1921	15½	15½	15	15	15	14½	13½	14	14	13½	13½	13½
1922	13½	12½	12½	12½	------	12½	12½	12½	12½	12½	12½	13
1923	12½	12½	12½	12½	12½	12½	------	12½	------	------	14	14
1924	14	14	14	14	14	14	14	14	14	14	14	14
1925	14	14	14	14	14	14	14	14	14	14	14	14
1926	14	14	14	14	14	14	14	14	14	14	14	14
1927	14	14	14	14	14	14	14	14	14	14	14	14

Bureau of Agricultural Economics. Compiled from reports of the bureau secured through the cooperation of milk distributors, producers' associations, and municipal officers.

TABLE 432.—*Creamery butter: Production, United States, 1917–1926*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
	1,000 lbs.	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
1917	43, 997	38, 459	47, 371	53, 809	75, 108	98, 898	94, 151	83, 936	76, 744	56, 176	42, 705	48, 157	759, 511
1918	44, 357	42, 389	49, 086	57, 332	85, 564	104, 385	97, 440	85, 148	72, 387	63, 886	45, 741	45, 560	793, 275
1919	52, 189	44, 343	54, 822	67, 487	103, 941	119, 357	104, 156	84, 458	68, 815	58, 723	45, 041	46, 662	849, 994
1920	49, 044	46, 355	56, 303	60, 622	86, 845	114, 695	110, 844	90, 669	77, 106	65, 129	53, 570	52, 395	863, 577
1921	58, 906	56, 556	67, 677	82, 763	119, 077	130, 633	111, 898	111, 638	89, 932	84, 374	70, 024	71, 460	1, 054, 938
1922	73, 505	67, 405	79, 532	86, 623	132, 351	150, 034	135, 231	114, 160	92, 359	83, 070	68, 628	70, 617	1, 153, 515
1923	83, 688	74, 134	88, 311	100, 547	134, 350	158, 371	138, 278	120, 802	102, 273	89, 297	74, 909	77, 254	1, 242, 214
1924	87, 468	86, 731	95, 760	106, 012	139, 954	161, 992	164, 443	137, 836	115, 102	100, 536	77, 282	82, 964	1, 356, 080
1925	87, 121	80, 218	92, 302	107, 023	145, 478	164, 253	158, 920	136, 738	108, 325	104, 520	85, 492	91, 136	1, 361, 526
1926	97, 893	94, 222	112, 432	121, 049	155, 912	178, 276	159, 554	133, 294	116, 732	103, 068	88, 481	90, 853	1, 451, 766

Bureau of Agricultural Economics.

TABLE 433.—*Creamery butter production in factories in the United States, by States, 1918–1926*

State	1918	1919	1920	1921	1922	1923	1924	1925	1926
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Alabama	912	696	398	742	917	831	839	1, 086	991
Arizona	1, 416	1, 000	828	1, 358	623	600	2, 107	1, 034	1, 489
Arkansas	427	363	345	586	731	996	1, 259	1, 174	1, 325
California	58, 293	61, 795	61, 870	68, 810	69, 941	81, 943	75, 509	72, 371	71, 701
Colorado	12, 652	13, 144	12, 979	15, 290	16, 410	18, 625	18, 130	18, 794	18, 255
Connecticut	813	930	877	1, 165	986	753	820	675	617
Delaware	270	253	350	395	203	154	150	80	67
District of Columbia	6	5	503	577	475	10	--------	461	52
Florida	39	17	--------	11	81	99	20	20	105
Georgia	4	6	7	85	979	1, 868	1, 826	1, 836	1, 982
Idaho	4, 330	4, 514	4, 660	4, 935	7, 582	9, 883	13, 431	15, 101	18, 456
Illinois	39, 855	44, 621	41, 051	48, 866	47, 249	51, 359	58, 225	56, 872	62, 544
Indiana	40, 624	44, 659	39, 223	47, 854	48, 158	51, 484	54, 355	54, 362	57, 592
Iowa	86, 943	87, 915	84, 290	106, 516	129, 778	141, 407	159, 378	156, 361	168, 827
Kansas	36, 660	35, 642	32, 899	37, 000	40, 204	42, 674	46, 844	47, 768	50, 998
Kentucky	3, 177	5, 321	7, 875	10, 746	12, 010	12, 244	12, 942	14, 087	16, 975
Louisiana	70	46	55	160	87	185	125	90	92
Maine	1, 453	1, 141	727	719	596	402	568	479	547
Maryland	297	315	440	620	542	382	500	339	266
Massachusetts	2, 439	2, 849	3, 198	3, 895	2, 999	1, 844	1, 790	2, 026	2, 150
Michigan	42, 582	45, 207	45, 404	55, 011	59, 954	64, 818	70, 676	70, 729	72, 040
Minnesota	124, 816	130, 786	120, 297	154, 268	170, 463	199, 926	229, 474	245, 669	268, 437
Mississippi	2, 274	2, 477	2, 626	4, 286	5, 778	5, 715	5, 648	4, 895	6, 896
Missouri	30, 175	38, 411	35, 228	42, 422	46, 565	51, 818	56, 801	55, 953	66, 861
Montana	4, 581	5, 389	5, 168	7, 439	7, 713	10, 667	13, 874	13, 908	15, 549
Nebraska	62, 477	60, 467	56, 661	66, 653	74, 809	76, 748	81, 423	83, 930	90, 882
Nevada	1, 496	1, 726	2, 018	2, 388	2, 642	2, 361	2, 640	2, 593	2, 432
New Hampshire	459	397	300	305	309	424	271	137	90
New Jersey	133	179	143	214	261	437	042	170	49
New Mexico	10	6	6	29	129	185	251	326	455
New York	13, 898	13, 716	16, 949	24, 298	25, 474	18, 893	25, 974	16, 960	14, 222
North Carolina	678	829	832	1, 263	1, 549	1, 718	1, 683	1, 556	1, 680
North Dakota	12, 050	14, 697	13, 419	16, 177	21, 675	23, 355	28, 515	31, 500	34, 898
Ohio	54, 555	60, 573	65, 594	78, 724	84, 193	79, 195	80, 932	77, 566	79, 386
Oklahoma	8, 167	10, 481	9, 596	10, 427	11, 142	14, 065	14, 421	15, 821	19, 664
Oregon	15, 357	14, 432	14, 288	15, 289	17, 158	18, 128	20, 993	21, 575	22, 570
Pennsylvania	10, 977	12, 466	11, 422	14, 629	12, 803	13, 142	12, 444	11, 476	11, 808
Rhode Island	70	65	58	77	76	76	105	68	75
South Carolina	17	27	16	19	165	537	527	429	364
South Dakota	18, 536	17, 479	14, 071	18, 886	21, 146	27, 447	24, 643	29, 193	29, 814
Tennessee	2, 068	3, 735	5, 903	8, 707	9, 164	11, 463	12, 762	11, 286	11, 826
Texas	4, 982	8, 289	9, 125	11, 257	10, 179	10, 956	11, 997	10, 866	14, 594
Utah	4, 174	3, 796	3, 567	4, 549	5, 913	7, 500	8, 585	7, 034	8, 037
Vermont	10, 858	10, 677	13, 253	14, 919	12, 289	11, 935	12, 294	9, 327	8, 305
Virginia	1, 372	1, 597	2, 210	2, 833	3, 118	4, 231	4, 614	3, 842	4, 378
Washington	16, 407	18, 487	23, 751	23, 228	24, 239	26, 666	29, 331	25, 673	28, 914
West Virginia	180	328	867	530	420	276	446	533	487
Wisconsin	82, 860	85, 054	97, 355	124, 504	142, 235	139, 895	153, 335	161, 369	159, 733
Wyoming	1, 286	1, 140	875	1, 277	1, 403	1, 894	1, 941	1, 999	2, 289
Total	818, 175	868, 125	863, 577	1, 054, 938	1, 153, 515	1, 242, 214	1, 356, 080	1, 361, 526	1, 451, 766

Bureau of Agricultural Economics. The compilations are made from reports of factories to the bureau.

Table 434.—*Creamery butter: Net receipts at five markets, 1918–1927*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
NEW YORK													
	1,000 lbs.	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
Av. 1921–1925	13, 763	12, 637	14, 938	14, 314	19, 145	25, 409	23, 297	19, 181	17, 091	15, 409	12, 904	13, 111	201, 198
1918	------	11, 571	12, 468	10, 867	15, 018	21, 902	20, 986	15, 708	13, 367	16, 032	11, 639	11, 642	------
1919	13, 590	13, 325	13, 419	14, 157	18, 934	23, 493	19, 314	16, 335	16, 244	13, 405	12, 635	9, 954	184, 805
1920	9, 750	9, 259	10, 724	6, 485	10, 144	17, 623	17, 801	15, 048	12, 329	9, 985	8, 627	8, 301	136, 076
1921	10, 003	9, 116	10, 721	11, 793	17, 640	22, 513	17, 885	19, 562	17, 514	14, 113	12, 866	12, 311	176, 037
1922	13, 385	13, 620	15, 918	13, 424	20, 438	28, 588	25, 391	19, 083	15, 053	13, 958	13, 240	12, 235	204, 333
1923	16, 829	12, 841	16, 706	15, 409	20, 444	26, 469	23, 594	18, 172	15, 823	14, 924	12, 750	13, 070	207, 031
1924	13, 389	13, 763	15, 800	15, 290	18, 231	25, 344	27, 579	20, 835	18, 626	17, 086	11, 909	13, 422	211, 274
1925	15, 207	13, 847	15, 546	15, 654	18, 971	24, 131	22, 034	18, 252	18, 439	16, 964	13, 755	14, 517	207, 317
1926	15, 321	15, 018	17, 953	17, 194	19, 405	27, 400	24, 817	17, 650	17, 458	15, 025	13, 648	13, 768	214, 657
1927	14, 731	15, 184	17, 372	17, 435	22, 574	27, 401	24, 445	22, 597	17, 278	16, 148	13, 624	13, 155	221, 944
CHICAGO													
Av. 1921–1925	12, 006	11, 479	13, 202	13, 589	20, 376	26, 813	23, 354	18, 882	13, 967	13, 132	10, 641	11, 860	189, 302
1918	------	11, 005	11, 802	11, 873	12, 207	20, 088	21, 990	15, 225	12, 568	12, 256	9, 084	9, 608	------
1919	10, 188	8, 413	9, 472	10, 657	19, 152	27, 588	20, 358	15, 339	10, 876	8, 894	6, 383	6, 257	153, 577
1920	8, 321	7, 809	9, 422	8, 551	12, 887	22, 214	22, 843	16, 699	12, 776	9, 438	7, 592	7, 557	146, 109
1921	8, 312	8, 190	10, 082	11, 997	18, 009	23, 619	17, 815	17, 600	12, 287	12, 122	9, 246	10, 756	160, 035
1922	11, 265	9, 959	11, 726	11, 885	19, 483	26, 156	22, 457	17, 841	12, 949	11, 072	9, 632	11, 736	176, 161
1923	13, 704	11, 840	13, 076	13, 184	19, 327	27, 191	21, 593	15, 436	13, 855	12, 719	11, 842	13, 170	186, 737
1924	14, 012	15, 641	16, 932	15, 779	22, 260	27, 699	27, 255	21, 193	15, 998	14, 258	10, 672	11, 650	213, 349
1925	12, 739	11, 767	14, 193	15, 101	22, 802	29, 398	27, 650	22, 342	14, 748	15, 489	12, 011	11, 988	210, 228
1926	13, 677	12, 968	14, 955	15, 330	20, 249	26, 802	23, 467	17, 861	14, 373	12, 389	11, 000	12, 474	195, 545
1927	12, 305	12, 243	15, 220	17, 430	22, 252	26, 569	22, 965	18, 501	13, 257	11, 998	10, 751	10, 943	194, 434
PHILADELPHIA													
Av. 1921–1925	3, 936	3, 584	4, 247	4, 153	5, 318	7, 613	6, 219	5, 230	4, 281	4, 190	3, 695	3, 874	56, 341
1918	------	681	2, 166	2, 054	2, 968	4, 084	3, 903	3, 364	2, 827	2, 848	2, 226	2, 396	------
1919	3, 161	2, 687	3, 099	3, 391	4, 186	5, 506	4, 155	3, 601	3, 424	3, 180	3, 460	2, 474	42, 324
1920	2, 698	2, 910	2, 809	2, 450	3, 044	5, 402	4, 836	3, 946	3, 884	3, 118	2, 488	2, 617	40, 202
1921	2, 686	2, 329	3, 191	3, 376	5, 075	6, 450	5, 362	4, 723	4, 222	3, 951	3, 459	3, 756	48, 580
1922	4, 536	3, 836	4, 032	3, 678	5, 377	7, 267	5, 681	4, 913	3, 779	3, 578	3, 368	3, 474	53, 519
1923	4, 223	3, 614	5, 023	4, 387	5, 348	7, 853	5, 306	4, 998	4, 350	4, 427	3, 527	3, 649	56, 705
1924	4, 332	4, 359	4, 345	4, 807	5, 719	8, 751	8, 165	5, 891	4, 747	4, 520	3, 802	3, 946	63, 384
1925	3, 904	3, 781	4, 646	4, 518	5, 069	7, 744	6, 582	5, 627	4, 306	4, 473	4, 319	4, 547	59, 516
1926	4, 689	4, 748	5, 635	5, 417	5, 983	8, 168	7, 061	5, 467	4, 558	4, 398	4, 759	4, 653	65, 536
1927	5, 004	4, 763	5, 387	5, 362	7, 415	8, 230	6, 826	6, 279	4, 818	4, 402	4, 503	4, 587	67, 576
BOSTON													
Av. 1921–1925	3, 844	4, 025	4, 439	4, 450	7, 594	12, 054	11, 104	6, 962	5, 794	4, 550	3, 303	2, 985	71, 105
1918	------	1, 540	3, 283	2, 802	4, 938	9, 634	9, 000	5, 214	3, 723	4, 588	3, 054	2, 875	------
1919	3, 318	3, 159	2, 595	3, 619	7, 898	11, 662	11, 324	6, 291	4, 332	2, 821	1, 827	1, 685	60, 531
1920	2, 658	2, 626	4, 437	3, 066	1, 698	13, 498	11, 909	7, 233	5, 590	3, 614	1, 966	2, 045	60, 340
1921	3, 077	3, 102	3, 428	3, 208	6, 650	10, 363	11, 146	4, 387	5, 782	5, 205	2, 713	2, 557	61, 618
1922	3, 957	3, 550	3, 963	3, 622	9, 017	14, 020	9, 558	7, 158	4, 967	3, 785	3, 706	3, 369	70, 672
1923	3, 802	4, 020	4, 810	5, 439	7, 037	12, 007	10, 977	7, 001	6, 001	4, 582	4, 199	3, 348	73, 223
1924	4, 362	5, 026	5, 368	5, 482	7, 754	13, 400	12, 538	7, 422	6, 437	4, 551	2, 331	2, 351	77, 022
1925	4, 021	4, 429	4, 628	4, 498	7, 514	10, 482	11, 300	8, 843	5, 783	4, 626	3, 567	3, 298	72, 989
1926	4, 184	5, 316	5, 539	5, 313	6, 620	11, 079	10, 834	7, 204	6, 364	4, 237	3, 356	3, 688	73, 734
1927	4, 065	4, 752	5, 428	5, 807	8, 983	10, 845	10, 565	7, 835	5, 269	4, 106	3, 422	3, 858	74, 935
SAN FRANCISCO													
Av. 1921–1925	1, 579	1, 331	1, 706	2, 171	2, 357	2, 290	2, 131	2, 109	1, 694	1, 824	1, 651	1, 653	22, 496
1919	1, 077	1, 257	1, 712	2, 373	2, 512	2, 088	1, 853	1, 489	927	1, 138	1, 241	1, 132	18, 799
1920	1, 265	1, 415	1, 848	2, 669	2, 352	1, 868	1, 482	1, 520	1, 412	1, 530	1, 330	1, 337	20, 028
1921	1, 404	1, 225	1, 685	1, 993	1, 917	1, 960	2, 005	2, 304	1, 755	2, 157	2, 015	1, 460	21, 880
1922	1, 481	1, 345	1, 829	2, 226	2, 321	2, 331	1, 851	1, 919	1, 729	1, 894	1, 583	1, 520	22, 029
1923	1, 746	1, 296	1, 666	2, 045	2, 093	2, 450	2, 224	1, 890	1, 596	1, 620	1, 407	1, 651	21, 684
1924	1, 355	1, 432	1, 637	2, 220	2, 973	2, 293	2, 169	1, 941	1, 659	1, 535	1, 448	1, 787	22, 449
1925	1, 910	1, 357	1, 712	2, 370	2, 482	2, 416	2, 404	2, 492	1, 729	1, 916	1, 802	1, 849	24, 439
1926	1, 553	1, 457	1, 996	2, 247	2, 207	2, 482	2, 214	2, 294	2, 008	2, 117	1, 417	1, 471	23, 463
1927	1, 601	1, 433	1, 802	2, 245	2, 486	2, 711	2, 481	2, 233	1, 612	1, 647	1, 307	1, 144	22, 702

TABLE 434.—*Creamery butter: Net receipts at five markets, 1918–1927*—Contd.

TOTAL

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
	1,000 lbs.	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
Av. 1921–1925	35, 128	33, 057	38, 533	38, 677	54, 790	74, 179	66, 104	52, 365	42, 827	39, 105	32, 194	33, 483	540, 442
1919	31, 334	28, 841	30, 297	34, 197	52, 682	70, 337	57, 004	43, 055	35, 803	29, 438	25, 546	21, 502	460, 036
1920	24, 692	24, 019	29, 240	23, 221	30, 125	60, 605	58, 871	44, 446	35, 991	27, 685	22, 003	21, 857	402, 755
1921	25, 482	23, 962	28, 107	32, 367	49, 291	64, 905	54, 213	48, 576	41, 560	37, 548	30, 299	30, 840	468, 150
1922	34, 624	32, 310	37, 468	34, 835	56, 636	78, 362	64, 938	50, 914	38, 477	34, 287	31, 529	32, 334	526, 714
1923	40, 304	33, 611	41, 281	40, 464	54, 249	75, 970	63, 694	47, 497	41, 625	38, 272	33, 525	34, 888	545, 380
1924	37, 450	40, 221	44, 082	43, 578	56, 937	77, 487	77, 706	57, 282	47, 467	41, 950	30, 162	33, 156	587, 478
1925	37, 781	35, 181	40, 725	42, 141	56, 838	74, 171	69, 970	57, 556	45, 005	43, 468	35, 454	36, 199	574, 489
1926	39, 424	39, 507	46, 078	45, 501	54, 464	75, 931	68, 393	50, 476	44, 761	38, 166	34, 180	36, 054	572, 935
1927	37, 706	38, 375	45, 209	48, 279	63, 710	75, 756	67, 282	57, 445	42, 234	38, 301	33, 607	33, 687	581, 591

Bureau of Agricultural Economics. Compiled from reports of bureau representatives in the various markets.

TABLE 435.—*Creamery butter: Cold-storage holdings, United States, 1915–1927*

Year	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sept. 1	Oct. 1	Nov. 1	Dec. 1
	1,000 lbs.	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
Average:												
1916–1920	48, 697	32, 673	19, 510	9, 849	6, 288	14, 395	59, 134	100, 967	112, 059	106, 552	93, 700	73, 147
1921–1925	45, 981	30, 730	19, 446	9, 477	5, 488	16, 076	66, 008	106, 191	118, 381	110, 116	91, 649	67, 999
1915	-------	-------	-------	-------	-------	-------	-------	68, 578	101, 662	99, 450	92, 719	71, 849
1916	48, 977	31, 139	15, 033	3, 346	1, 082	7, 017	53, 863	102, 537	105, 836	100, 522	85, 260	67, 292
1917	46, 134	30, 474	16, 952	6, 805	3, 607	9, 953	49, 982	88, 992	108, 179	109, 154	100, 115	79, 928
1918	50, 726	26, 618	18, 808	14, 629	9, 536	12, 698	49, 140	88, 305	99, 334	87, 883	80, 874	65, 111
1919	43, 910	36, 777	24, 191	11, 909	9, 659	29, 435	90, 158	123, 546	131, 388	121, 816	100, 474	73, 654
1920	53, 737	38, 359	22, 568	12, 555	7, 554	12, 872	52, 526	101, 455	115, 558	113, 385	101, 778	79, 750
1921	58, 682	41, 486	27, 103	14, 732	7, 712	21, 682	61, 991	82, 838	92, 292	90, 116	77, 983	65, 129
1922	48, 412	35, 047	22, 582	9, 113	3, 830	13, 202	67, 410	103, 151	112, 039	96, 680	73, 857	47, 773
1923	26, 819	16, 122	8, 910	4, 824	3, 248	10, 112	62, 768	101, 774	102, 731	96, 117	76, 472	51, 508
1924	30, 299	15, 246	9, 847	7, 842	8, 913	22, 348	74, 184	134, 118	156, 440	153, 494	135, 018	100, 832
1925	65, 694	45, 748	28, 789	10, 875	3, 739	13, 036	63, 687	109, 075	128, 403	114, 172	94, 916	74, 754
1926	52, 785	39, 381	26, 313	17, 392	17, 527	30, 561	86, 897	131, 152	138, 151	125, 342	100, 871	64, 381
1927	34, 347	17, 952	7, 952	3, 044	3, 436	25, 404	89, 996	145, 147	163, 701	147, 396	118, 679	83, 224

Bureau of Agricultural Economics. Compiled from reports from cold-storage establishments.

TABLE 436.—*Butter: Gross receipts at five markets, by State of origin, 1922–1927*

NEW YORK

State	1922	1923	1924	1925	1926	1927												
						Total	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Minnesota	80, 589	84, 944	74, 166	57, 206	57, 038	57, 081	3, 654	4, 000	4, 928	4, 872	5, 530	6, 577	6, 834	5, 955	4, 242	4, 532	3, 330	2, 627
Iowa	43, 489	48, 440	57, 781	56, 833	62, 093	66, 935	4, 551	4, 905	6, 032	5, 419	7, 694	9, 070	7, 413	6, 489	4, 240	4, 047	3, 346	3, 729
Illinois	33, 538	33, 830	35, 039	39, 440	40, 037	37, 954	3, 173	2, 745	2, 580	2, 985	4, 044	4, 780	4, 315	3, 040	2, 624	2, 664	2, 563	2, 441
Nebraska	24, 074	20, 359	24, 811	25, 088	27, 157	28, 457	1, 564	1, 921	2, 290	2, 359	3, 154	3, 636	2, 973	3, 062	2, 470	1, 833	1, 463	1, 732
Ohio	10, 631	9, 834	7, 350	7, 121	6, 674	7, 565	319	255	336	271	545	752	1, 102	1, 085	871	778	695	556
Wisconsin	12, 803	11, 771	13, 730	16, 903	17, 792	17, 615	1, 540	1, 668	2, 093	2, 065	1, 092	1, 970	1, 282	1, 565	1, 126	1, 245	664	1, 305
New York	9, 598	6, 130	8, 185	6, 974	6, 177	5, 385	276	257	131	198	366	700	660	693	627	627	403	447
Michigan	7, 213	7, 075	11, 265	15, 498	13, 669	13, 566	943	632	468	574	1, 179	2, 052	1, 597	1, 110	1, 280	1, 187	1, 635	909
Indiana	5, 991	5, 222	3, 788	5, 958	5, 209	5, 417	177	267	366	367	735	741	718	675	409	313	432	217
Missouri	3, 674	4, 649	3, 930	5, 396	6, 045	6, 540	392	359	405	325	657	563	629	1, 110	766	470	475	389
Pennsylvania	2, 349	1, 279	988	525	1, 176	1, 025	7	128	59	58	122	17	93	123	105	188	108	17
Tennessee	1, 185	1, 132	859	1, 034	1, 881	2, 369	83	65	27	96	309	245	255	201	417	237	263	171
California	364	288	87	102	1	161				128	25							8
Kansas	429	1, 294	1, 064	847	2, 065	3, 808	280	298	345	278	399	300	166	473	303	418	249	299
Massachusetts	417	259	647	345	204	223	10	47	3	12		(1)			68	23	40	20
Virginia	652	417	684	432	417	473	24	16	14	27	38	134	34	62	76	22	13	13
South Dakota	353	260	270	279	1, 218	1, 129	116	99	78	74	91	100	76	97	66	132	96	104
Kentucky	701	517	954	463	710	978	6	3	62	81	149	323	110	67	41	24	(1)	112
North Dakota	246	134	397	193	109	573	2	(1)	(1)			4	7	175	126	67	63	129
Vermont	27	46		58	22	52	2	(1)		(1)	15	28	6				1	
Maryland	380	151	132	276	104	131	2	7	21	22	3	5	20	24	23			4
North Carolina	195	358	198	193	155	340	11	13	14	14	27	71	60	43	25	26	13	23
Georgia	95	98	97	178	52	38	3	2	1	7	18	1	1	(1)	(1)	(1)	(1)	5
Alabama	124	234	70	138	171	220	12	9	16	14	25	12	9	29	18	17	28	31
Washington	29	194		27	224	310	90	25	86	44	40		24				1	
New Jersey	80	129		22	466	256	(1)	(1)	(1)	(1)	9	9	1	98	139			(1)
Mississippi	54	142		203	663	1, 251	29	25	6	96	176	114	289	183	150	21	88	74
Oklahoma		261		327	535	363	17		23		37	20	62	69	65	50		20
Montana			465	37	19	288		45	23	64	29					49	25	53
Other States	496	686	852	181	513	730	62	61	28	78	71	38	26	155	67	43	47	54
Canada	1, 828	3, 631	950	1, 850	146	89		26	20				20	23				
Total	241, 604	243, 764	248, 759	244, 127	252, 742	261, 322	17, 345	17, 878	20, 455	20, 528	26, 579	32, 262	28, 782	26, 606	20, 344	19, 013	16, 041	15, 489

[1] Not over 500 pounds.

TABLE 436.—*Butter: Gross receipts at five markets, by State of origin, 1922–1927*—Continued

CHICAGO

State	1922	1923	1924	1925	1926	1927 Total	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Wisconsin	74, 773	70, 588	79, 928	75, 941	72, 200	64, 611	4, 227	3, 945	4, 826	6, 020	7, 892	10, 131	7, 727	5, 580	4, 297	3, 909	3, 076	2, 981
Minnesota	37, 483	39, 611	46, 767	54, 859	43, 569	48, 057	3, 312	3, 586	5, 769	4, 188	4, 677	4, 932	5, 069	3, 891	3, 185	3, 601	2, 946	2, 901
Iowa	40, 735	42, 108	46, 896	46, 150	41, 092	39, 347	2, 560	2, 777	2, 767	3, 487	4, 729	5, 728	4, 398	3, 477	2, 860	2, 560	1, 977	2, 027
Nebraska	16, 958	17, 433	20, 054	19, 361	22, 505	17, 090	1, 130	751	885	1, 183	1, 065	1, 857	2, 244	2, 280	1, 462	1, 285	1, 421	1, 527
South Dakota	9, 639	14, 249	15, 971	18, 151	16, 402	16, 513	1, 177	1, 179	1, 649	1, 569	1, 382	2, 168	2, 586	1, 770	859	848	644	682
Kansas	5, 935	10, 300	11, 098	7, 864	8, 036	9, 989	732	656	616	810	1, 400	1, 081	843	1, 053	760	391	662	985
Illinois	7, 465	7, 392	8, 870	5, 819	6, 632	8, 057	303	202	187	255	1, 398	1, 972	1, 265	971	608	428	264	204
Missouri	8, 959	11, 188	11, 975	9, 678	10, 411	13, 484	582	758	685	1, 187	1, 452	2, 146	1, 815	1, 310	1, 043	489	852	1, 165
North Dakota	3, 049	3, 418	6, 301	8, 511	6, 114	4, 181	233	183	271	403	316	424	672	701	331	310	217	120
Oklahoma	1, 733	1, 894	2, 144	2, 735	4, 392	4, 510	219	266	265	605	1, 108	671	299	268	228	197	117	267
Colorado	1, 317	1, 239	1, 829	430	828	678	125	115	89	114	144	7	6	10		17	21	30
Ohio	874	425	360	619	417	194	33	3	6	4	7	35	13	15	10	33	32	3
Michigan	1, 609	1, 966	1, 761	1, 474	1, 297	1, 024	64	92	82	73	135	180	101	79	42	119	11	46
Indiana	1, 027	1, 109	1, 102	805	867	749	43	52	10	20	145	290	110	24	27	10	7	11
Kentucky	291	871	560	539	957	1, 888	32	44	33	134	260	245	178	281	89	83	430	79
Texas	35	216	102	78	212	3, 680	1	95	238	706	663	202	340	598	193	207	265	172
Montana	299	643	1, 077	343	107	194	96	4	9	45	14					1	25	
Tennessee	34	112	35	137	126	438	2	8	2	138	113	25	39	49	4	22	25	11
Mississippi	298	144	198	66	44	31	1	1	1	(1)	1	4	11	5	7		(1)	
California	192	319	77		(1)	76			1	75								
Pennsylvania	19	36	103	55	43	2	(1)	(1)	1	(1)							1	(1)
Idaho	34	233	202		64													
New York	49	25	153	69	35	31	1		(1)				1		1		8	20
Utah	120	50	192															
Other States	98	108	328	154	196	376	12	93	20	68	17	42	63	18	31	3	3	6
Canada	47	215		470														
Total	[2]213, 101	225, 892	258, 083	254, 308	236, 546	235, 200	14, 885	14, 810	18, 412	21, 084	26, 918	32, 140	27, 780	22, 380	16, 037	14, 513	13, 004	13, 237

PHILADELPHIA

State	1922	1923	1924	1925	1926	1927 Total	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Minnesota	24, 776	27, 194	34, 753	32, 168	40, 986	45, 478	2, 804	3, 179	3, 643	3, 909	4, 798	5, 416	4, 561	4, 413	3, 080	3, 394	3, 533	2, 748
Illinois	9, 973	11, 753	10, 874	11, 156	7, 766	4, 807	498	220	276	234	580	498	279	365	214	563	522	558
Ohio	4, 309	2, 699	3, 437	3, 224	3, 505	3, 162	264	142	168	216	355	310	291	281	367	240	272	256
Pennsylvania	3, 797	2, 571	2, 297	1, 735	1, 268	1, 097	97	75	82	101	110	190	150	105	69	36	37	45

Indiana	4,447	3,757	2,392	1,688	1,848	1,736	76	101	137	102	159	129	173	150	243	159	153	154
Wisconsin	4,710	4,119	4,616	2,963	4,305	6,313	959	785	834	558	413	722	597	460	286	148	172	379
Michigan	1,605	1,812	3,446	6,415	3,418	1,835	128	117	160	78	166	389	341	62	231	25	18	120
New York	2,275	5,673	1,926	2,221	1,262	596	57		30	41	68	20	30	20	89		84	157
Iowa	1,391	1,314	2,783	2,313	4,288	5,237	484	419	543	544	697	734	504	407	248	241	223	193
Missouri	483	942	1,677	637	1,490	1,444	173	46	31	95	267	83	143	143	231	79	49	104
Tennessee	1,754	915	1,979	722	1,101	1,969	32	57	54	125	394	295	242	322	220	93	90	45
Virginia	1,145	1,247	1,638	1,196	1,027	935	66	57	54	70	73	129	159	128	61	66	38	34
California	357	59	224	24	287	243				48								195
New Jersey	57	285	19	245	44	38		(1)				38			(1)			
North Dakota	253	42	44		40	76	21	16	12	2	24							1
Delaware	258	71	21	189	1	6		(1)	(1)	1	3	2						
Nebraska	1,677	1,757	2,409	3,510	4,957	4,341	338	471	384	263	483	511	604	460	220	201	169	237
Maryland	453	1,057	137	138	242	205	9	6	4	2	19	21	1		(1)	14	51	78
South Dakota	6	11	110	76	158	263	19	45	37	15	41	21	2	40	17	25		1
Kentucky	159	119	187	57	221	313					23	56	64		69	21		80
Kansas	86	223	320	628	127	370	5	(1)		27	49	82	45	85	66	4	2	5
North Carolina	1	14	7	26	87	33	1	2		3	6	7	6	8				(1)
West Virginia	93	160	145	146	197	277	17	19	14	18	47	37	15	9	16	14	30	41
Montana			221	80	44	8	5	1	2									
Mississippi	346	401	311	115	276	493			50	28	120	209	36					50
Other States	140	151	367	269	400	452		5	2	7	75	37	14	137	101	2	4	68
Canada		252	391	173														
Total	64,551	68,598	76,731	72,064	79,345	81,727	6,053	5,763	6,517	6,487	8,970	9,936	8,257	7,595	5,828	5,325	5,447	5,549

BOSTON

Illinois	33,273	33,517	25,384	13,555	11,766	13,557	1,390	1,753	1,248	1,121	1,778	1,094	924	742	471	756	729	1,551
Minnesota	11,213	15,880	22,744	26,975	30,948	30,830	1,266	1,621	2,056	2,223	2,928	4,664	4,852	4,018	2,664	1,502	1,470	1,567
Vermont	6,339	5,854	5,923	4,071	3,075	2,318	152	162	195	222	249	428	292	137	132	107	103	139
New York	5,776	5,578	5,468	5,769	3,327	2,607	78	66	324	354	168	72	632	447	122	255	53	36
Iowa	3,982	3,023	3,361	4,360	4,616	3,969	139	270	297	288	511	469	686	329	362	299	168	151
Ohio	4,041	3,064	3,282	2,661	2,046	2,751	211	55	149	77	395	507	487	208	264	193	131	74
Indiana	2,554	2,722	2,436	1,434	1,122	1,576	51	21	62	117	333	432	152	2	28	110	188	80
Nebraska	2,152	3,274	6,378	8,086	8,860	10,335	477	507	607	759	1,450	1,718	1,438	1,170	737	585	480	407
Michigan	2,533	1,555	2,394	1,867	1,928	1,675	5	25	134	176	247	392	241	84	149	193	25	4
South Dakota	2,133	1,891	2,450	3,070	3,609	3,526	76	208	182	122	392	764	788	428	322	143	80	20
Missouri	884	646	1,404	3,170	2,940	3,151	66	78	147	124	562	591	489	408	307	211	51	117
Wisconsin	2,215	1,813	1,983	2,463	3,101	2,238	42	18	230	372	405	442	219	165	106	101	95	43
Massachusetts	870	702	723	989	735	346	21	2	2	22	60	68	2	1	2	1	163	2
New Hampshire	467	263	143	19	22	94	63	3	6	4	4	6	1	1	(1)	(1)	3	3
Pennsylvania	303	188	26	143	119	240	38	23	(1)	24			23	82	25	(1)	1	24
Kentucky	132	72	91	46	30	228		42		48	40	32	21		4	20	21	
Kansas	404	402	507	1,048	1,705	1,532	190	208	61	194	187	87	205	225	69	40	36	30
Maine	197	87	196	192	116	167	2	20	20	4	1	49	37	27	2	2	3	(1)
Oklahoma	319	166	288	151	463	664	87	79	49	56	121	31	40	36	63	50	16	36
North Dakota	302	1,545	1,230	2,167	2,479	1,871	201	155	267	226	148	277	265	246	63			23

1 Not over 500 pounds.

2 Includes 29,000 pounds from New Zealand.

TABLE 436.—*Butter: Gross receipts at five markets, by State of origin, 1922–1927*—Continued

BOSTON—Continued

State	1922	1923	1924	1925	1926	1927 Total	1927 Jan.	1927 Feb.	1927 Mar.	1927 Apr.	1927 May	1927 June	1927 July	1927 Aug.	1927 Sept.	1927 Oct.	1927 Nov.	1927 Dec.
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Montana	23	49	220	39	24	183	27	26	54							28	48	
Other States	361	231	261	201	211	754	8	24	39	25	164	122	133	91	57	40	1	50
Canada		137	29		1	5		(1)					5					
Total	80,473	82,659	86,921	82,476	83,243	84,617	4,590	5,366	6,129	6,558	10,143	12,245	11,932	8,847	5,949	4,636	3,865	4,357

SAN FRANCISCO

State	1922	1923	1924	1925	1926	1927 Total	1927 Jan.	1927 Feb.	1927 Mar.	1927 Apr.	1927 May	1927 June	1927 July	1927 Aug.	1927 Sept.	1927 Oct.	1927 Nov.	1927 Dec.
California	23,352	21,805	22,984	21,587	20,701	18,976	1,215	1,210	1,797	2,304	2,343	2,040	1,738	1,577	1,268	1,209	1,160	1,115
Oregon	585	1,177	948	1,195	2,306	2,253	210	156	130	164	401	518	280	143	76	90	60	25
Washington	332	682	606	469	327	300	122	15	4	1	10	28	1	27	43	45	1	3
Nevada	388	293	258	252	63	113	5	8	1		3	9	7	2	12	30	28	8
Idaho	402	502	490	1,043	1,191	1,722	236	222	132	140	140	98	120	199	55	214	91	75
Montana	155	361	700	1,895	2,331	2,173	36	70	49	31	28	206	500	429	318	236	171	99
North Dakota	145	76		20														
Utah	136	179	158	98	95	223	59	4	3			27	55	13	11	45	6	
Illinois	118		1	204														
Colorado	120	30	21	545	192	406						76	48	97	74	69	21	21
Nebraska	46	25	47	349	55	77			4	1			24	48				
Minnesota	74		172	268	339	441						164	146	92	39			
Iowa	51	24		237														
Other States	12	41	26	264	4	25						24			1			
Canada		316		326														
Total	25,916	25,511	26,411	28,752	27,604	26,709	1,883	1,685	2,120	2,641	2,925	3,190	2,919	2,627	1,897	1,938	1,538	1,346

Bureau of Agricultural Economics. Compiled from reports of bureau representatives in the various markets.

[1] Not over 500 pounds.

TABLE 437.—*Butter: International trade, average 1909–1913, annual 1923–1926*

Country	Year ended Dec. 31									
	Average, 1909–1913		1923		1924		1925		1926, preliminary	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
PRINCIPAL EXPORTING COUNTRIES	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
Argentina	113	6, 934	6	61, 486	3	65, 437	6	59, 282	15	64, 234
Australia	46	77, 859	[1] 2, 368	53, 798	[1] 120	111, 086	[2] 13	128, 494	3, 726	[2] 83, 016
Canada	3, 388	3, 973	2, 738	13, 174	1, 174	22, 344	100	26, 647	9, 152	9, 814
Denmark	6, 241	195, 530	1, 593	246, 157	2, 049	272, 033	1, 744	270, 674	2, 816	292, 115
Estonia	-------	-------	(3)	5, 175	-------	7, 025	-------	14, 208	-------	19, 161
Finland	2, 370	26, 337	103	14, 476	14	18, 184	4	29, 081	196	29, 127
Irish Free State	-------	-------	-------	-------	8, 757	51, 187	9, 381	44, 975	6, 501	56, 099
Italy	972	7, 870	526	2, 905	1, 002	6, 436	259	8, 009	153	5, 707
Latvia [2]	-------	-------	48	6, 399	2	8, 084	10	15, 772	32	22, 343
Netherlands	4, 987	75, 133	1, 687	52, 769	3, 613	76, 570	5, 756	87, 598	3, 347	100, 428
New Zealand	47	38, 761	7	140, 016	1	142, 179	13	139, 476	16	130, 820
Russia	2, 202	150, 294	[2] 112	10, 978	[2] 339	[2] 49, 456	[2] 191	[2] 55, 476	-------	[2] 59, 405
Spain	939	259	378	391	344	423	295	583	309	408
Sweden	330	45, 870	3, 499	5, 420	1, 234	11, 827	406	20, 333	79	33, 353
PRINCIPAL IMPORTING COUNTRIES										
Algeria	1, 946	9	1, 271	35	1, 553	36	1, 830	32	2, 067	[2] 53
Austria	[4] 6, 281	[4] 4, 267	3, 600	1	3, 864	[2] 10	2, 856	[2] 334	4, 648	583
Belgium	14, 024	3, 125	21, 337	220	10, 322	543	9, 202	870	5, 014	1, 899
China	[5] 1, 677	-------	1, 702	-------	1, 551	-------	1, 697	-------	1, 762	-------
Cuba	1, 459	-------	2, 285	-------	2, 443	-------	2, 655	-------	2, 169	-------
Czechoslovakia	-------	-------	7, 806	24	3, 637	[2] 58	1, 203	310	1, 160	334
Dutch East Indies	4, 152	-------	7, 322	-------	7, 092	-------	7, 321	-------	[6] 8, 301	-------
Egypt	2, 350	[7] 166	1, 672	74	2, 354	57	2, 384	56	2, 839	44
France	13, 713	40, 769	20, 876	17, 314	6, 176	7, 997	6, 655	8, 211	1, 490	11, 040
Germany	111, 441	498	2, 903	147	117, 896	59	212, 993	304	215, 584	264
Greece	206	8	5, 677	[2] 6	10, 727	-------	[2] 914	-------	-------	-------
Norway	976	3, 137	5, 826	26	1, 276	419	1, 467	468	2, 369	338
Peru	462	20	1, 337	12	1, 814	10	1, 653	9	1, 844	6
Philippine Islands	1, 665	-------	853	-------	1, 298	-------	991	-------	1, 188	-------
Switzerland	11, 106	44	14, 684	20	19, 993	252	19, 089	177	17, 815	131
Trinidad and Tobago	847	-------	1, 092	[2] 18	1, 049	-------	918	-------	1, 038	-------
Union of South Africa	3, 913	26	1, 166	601	1, 579	411	705	793	48	261
United Kingdom	455, 489	1, 170	554, 803	2, 092	570, 761	2, 239	616, 300	1, 445	626, 325	1, 688
United States	1, 647	4, 125	23, 741	5, 846	19, 405	8, 257	7, 212	5, 343	8, 029	5, 483
Total, 33 countries	654, 989	686, 193	693, 018	639, 580	803, 342	862, 640	916, 223	918, 960	930, 032	928, 154

Bureau of Agricultural Economics. Official sources, except where otherwise noted. Butter includes all butter made from milk, melted and renovated butter, but does not include margarine, cocoa butter or ghee.

[1] Year beginning July 1.
[2] International Yearbook of Agricultural Statistics.
[3] Less than 500 pounds.
[4] Average for Austria-Hungary.
[5] 4-year average.
[6] Java and Madura only.
[7] 2-year average.

TABLE 438.—*Butterfat: Estimated price per pound, received by producers, in the United States, 1920–1927*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1920	-------	-------	-------	-------	-------	-------	-------	-------	55. 3	56. 3	56. 5	49. 4
1921	48. 4	42. 8	44. 9	41. 8	29. 7	27. 6	31. 6	36. 8	36. 2	40. 0	40. 6	39. 9
1922	33. 4	34. 0	34. 5	33. 4	33. 4	33. 9	34. 8	32. 8	35. 5	39. 2	44. 2	50. 3
1923	47. 0	44. 9	44. 9	46. 0	40. 3	36. 9	36. 7	38. 7	42. 2	44. 1	47. 8	49. 2
1924	50. 6	48. 5	46. 4	40. 8	37. 6	37. 1	37. 8	35. 8	36. 6	36. 6	37. 0	41. 1
1925	40. 6	37. 9	41. 5	40. 5	40. 3	39. 9	40. 5	41. 3	42. 6	47. 1	47. 8	47. 6
1926	45. 2	43. 1	42. 9	40. 4	39. 1	39. 3	38. 6	38. 6	40. 5	42. 4	44. 8	47. 9
1927	46. 9	46. 8	48. 0	47. 1	43. 6	40. 8	40. 3	39. 4	41. 6	44. 4	45. 8	47. 8

Bureau of Agricultural Economics. Based on returns from special price reporters.

TABLE 439.—*Butter, 92-score creamery: Average wholesale price, at leading markets, 1910–1927*

NEW YORK

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
Average:	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1914–1920	46	44	44	45	41	40	40	41	44	47	50	51	44
1921–1925	47	45	46	43	39	38	40	41	43	46	49	49	44
1910	33	30	33	31	28	28	28	29	30	30	31	30	30
1911	26	26	24	21	22	23	25	26	27	30	34	37	27
1912	39	32	31	33	30	27	27	27	30	31	34	37	32
1913	35	36	37	35	29	28	27	28	32	31	34	36	32
1914	33	29	28	25	26	27	28	30	31	32	35	34	30
1915	34	32	30	31	29	28	27	26	27	29	31	35	30
1916	33	34	37	36	31	30	29	31	34	35	39	40	34
1917	40	44	42	44	40	39	39	41	44	45	46	50	43
1918	52	50	44	42	42	44	45	46	56	58	63	69	51
1919	62	52	62	64	58	52	53	55	59	68	71	72	61
1920	65	66	67	71	61	57	57	55	59	60	63	55	61
1921	52	47	48	46	32	33	40	43	43	47	45	44	43
1922	37	37	38	38	38	37	36	35	41	46	51	54	41
1923	52	50	49	46	42	39	39	44	46	48	53	55	47
1924	53	50	47	38	39	41	40	38	38	39	43	45	43
1925	40	41	48	45	43	42	43	43	48	51	51	49	45
1926	45	45	43	39	41	41	40	42	45	47	51	55	44
1927	49	52	50	50	43	43	42	42	46	48	50	52	47

CHICAGO

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
Av. 1921–1925	45	45	46	41	36	38	38	39	42	44	48	48	42
1918			41	42	42	42	43	45	55	56	62	67	50
1919	60	49	60	62	57	51	51	53	57	64	69	68	58
1920	63	63	66	64	57	55	55	54	57	57	60	51	58
1921	48	47	47	44	29	32	39	40	42	45	44	43	42
1922	34	37	38	37	34	36	34	34	39	44	50	53	39
1923	50	50	49	45	40	39	38	43	46	47	52	53	46
1924	52	49	46	37	37	39	38	37	37	37	42	42	41
1925	39	40	48	43	41	42	42	42	46	49	50	47	44
1926	43	43	42	38	39	39	39	40	43	46	49	53	43
1927	48	50	49	48	41	40	40	41	45	46	48	51	46
Philadelphia:													
1926	46	45	43	40	42	42	41	43	46	48	52	56	45
1927	50	52	51	51	44	43	43	43	47	49	51	53	48
Boston:													
1926	45	45	43	40	41	42	41	42	45	47	48	54	44
1927	50	52	51	51	44	43	42	42	46	48	48	50	47
San Francisco:													
1926	44	46	42	40	40	41	41	44	44	44	45	48	43
1927	47	48	45	42	41	42	42	44	47	48	49	46	45

Bureau of Agricultural Economics. Compiled from Urner-Barry reports, 1910-1917, average of daily range; subsequently from reports of bureau representatives in the markets. Earlier data for cities showing prices for 1926 and 1927 only available in 1925 Yearbook, p. 1094, Table 501.

TABLE 440.—*Butter: Average export price per pound in Copenhagen, Denmark, 1914–1927*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Av.
Average:	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1914–1920	46.2	43.9	45.1	44.5	42.2	41.4	42.1	43.0	45.2	47.9	51.5	49.9	45.2
1921–1925	39.2	39.3	39.5	36.8	34.0	34.3	37.3	40.0	41.2	42.1	41.6	39.5	38.7
1914	26.1	25.6	25.6	24.1	23.4	23.9	25.9	24.4	25.0	27.8	27.3	29.9	25.8
1915	29.6	26.9	28.0	27.6	29.6	29.1	31.0	32.6	34.7	41.6	40.5	36.6	32.3
1916	33.8	35.4	37.8	36.8	36.3	35.7	36.7	40.1	42.1	42.6	44.3	44.9	38.9
1917	45.3	39.6	38.4	37.2	38.6	40.5	45.0	49.7	54.6	65.4	68.4	65.5	49.0
1918	64.2	63.7	64.0	65.0	65.3	64.7	65.1	65.0	62.0	58.3	75.6	76.0	65.7
1919	75.8	73.8	72.4	71.1	58.2	50.8	48.4	46.5	54.7	53.8	59.5	52.1	59.8
1920	48.9	42.1	49.2	49.8	44.2	44.8	42.4	42.9	43.6	45.7	44.7	44.0	45.2
1921	42.4	39.3	40.4	43.9	33.5	32.4	38.3	41.1	36.4	38.3	39.9	31.8	38.1
1922	31.1	31.0	32.9	33.8	33.5	37.0	39.4	39.1	41.1	40.7	39.9	39.7	36.6
1923	40.5	41.3	41.0	34.5	29.5	29.3	30.7	34.7	40.3	38.9	39.4	41.4	36.8
1924	40.0	39.5	36.9	31.3	36.4	33.4	37.8	41.1	42.3	46.1	44.2	46.8	39.6
1925	42.0	45.4	46.1	40.6	36.9	39.4	40.5	44.2	45.7	46.5	44.6	37.8	42.5
1926	36.5	40.2	38.8	36.2	34.8	35.7	35.4	36.1	36.6	36.3	34.9	37.1	36.6
1927	36.4	39.3	36.8	35.2	32.9	33.2	32.2	35.0	39.6	39.4	41.2	33.0	36.6

Bureau of Agricultural Economics. Danish Butter Journal (Smor Tidende) official quotations. For earlier years, 1882–1913, see the United States Department of Agriculture Yearbook, 1923, p. 923.

Conversions from Danish quotations in ore per pound (1.1023 pounds) at par of exchange (100 ore=26.8 cents) to July, 1914; July, 1914, to date from weekly quotations in kroner per 100 kg., at average monthly exchange rate as quoted by Federal Reserve Board.

TABLE 441.—*Cheese,* whole milk American Cheddar: Production in the United States, 1917–1926*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
	1,000 lbs.	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000, lbs.*
1917	8, 519	9, 415	11, 918	17, 577	28, 932	38, 796	35, 296	32, 248	37, 613	22, 303	14, 262	8, 070	264, 949
1918	8, 143	7, 860	11, 992	17, 931	31, 285	40, 184	34, 332	29, 996	25, 424	18, 862	12, 172	9, 097	247, 278
1919	10, 956	11, 855	19, 009	21, 642	34, 849	44, 599	35, 465	30, 940	26, 257	23, 114	13, 107	10, 044	281, 837
1920	10, 457	11, 509	14, 954	18, 856	29, 832	41, 376	34, 313	26, 787	22, 935	20, 054	13, 308	10, 303	254, 684
1921	11, 889	12, 857	17, 678	23, 521	34, 556	36, 444	26, 977	27, 652	23, 612	21, 496	13, 426	11, 618	261, 726
1922	12, 837	13, 927	18, 774	21, 740	31, 349	36, 254	33, 265	29, 496	25, 581	25, 785	18, 382	15, 416	282, 806
1923	15, 092	15, 326	20, 184	24, 014	32, 942	41, 382	38, 288	31, 822	28, 648	25, 566	18, 236	16, 608	308, 108
1924	17, 718	18, 886	22, 955	24, 597	33, 657	43, 517	40, 716	33, 602	30, 539	26, 210	17, 252	15, 046	324, 695
1925	16, 834	17, 991	21, 598	26, 889	38, 012	45, 782	43, 706	37, 659	31, 548	28, 253	20, 349	18, 619	347, 240
1926	19, 519	19, 984	25, 216	29, 221	38, 598	46, 326	40, 164	33, 239	28, 809	23, 164	16, 386	15, 295	335, 915

Bureau of Agricultural Economics.

TABLE 442.—*Cheese, whole milk American Cheddar: Production, United States, by States, 1919–1926*

State	1919	1920	1921	1922	1923	1924	1925	1926
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Alabama			29		51			
Arizona	315	150	450	47	84	96	67	97
Arkansas				18				
California	5, 661	5, 043	5, 904	3, 226	3, 082	2, 850	3, 026	3, 466
Colorado	161	81	54	42	99	434	293	473
Connecticut			2					
Delaware				4				
District of Columbia		43						
Georgia					3	44	24	
Idaho	2, 578	1, 722	2, 117	3, 368	5, 311	7, 343	7, 320	7, 986
Illinois	2, 538	999	1, 751	2, 401	2, 875	2, 498	2, 444	2, 902
Indiana	70	42	117	62	78	306	198	234
Iowa	859	545	313	344	361	530	501	383
Kansas	26	19	61	147	110	176	192	194
Kentucky							37	
Louisiana	1							
Maine						34		128
Maryland	43	9	29	6				
Massachusetts	4							
Michigan	5, 188	4, 032	5, 064	3, 657	4, 342	5, 867	5, 844	6, 827
Minnesota	8, 998	5, 502	5, 693	5, 291	7, 229	9, 790	8, 419	8, 984
Mississippi								
Missouri	302	380	382	96	224	105	252	312
Montana	269	233	113	259	641	792	1, 296	1, 484
Nebraska	30	3	61	43	68	135	275	718
Nevada			25	24		79	66	80
New Hampshire	8	3	77				6	
New Jersey	446	130		634	196	155		
New Mexico				74	135	92	56	
New York	46, 510	30, 829	37, 970	47, 726	37, 448	36, 608	38, 401	31, 663
North Carolina	228	109	86	103	111	80	62	61
Ohio	963	659	654	195	128	366	253	269
Oklahoma	1			2		37		5
Oregon	8, 348	8, 282	8, 777	8, 720	7, 678	9, 951	9, 903	11, 517
Pennsylvania	2, 928	2, 673	3, 208	2, 209	2, 497	1, 750	1, 349	1, 681
South Dakota	32	9	19		8	43	10	
Tennessee	51	26	50	71	284	398	321	172
Texas	1		15	31				
Utah	907	849	1, 027	3, 219	2, 130	2, 162	1, 753	1, 809
Vermont	2, 960	1, 382	1, 380	954	1, 200	1, 755	1, 120	1, 114
Virginia	60	35	28	97	163	152	69	49
Washington	1, 145	1, 143	1, 910	2, 928	2, 762	2, 998	3, 076	3, 130
West Virginia	56	24	41	16				
Wisconsin	201, 836	188, 548	182, 777	193, 376	226, 916	235, 186	258, 684	248, 059
Wyoming	1, 612	1, 180	1, 543	3, 416	1, 791	1, 883	1, 923	2, 118
Total	295, 144	254, 684	261, 727	282, 806	308, 014	324, 695	347, 240	335, 915

Bureau of Agricultural Economics. The compilations are made from reports of factories to the bureau.

TABLE 443.—*Cheese: Gross receipts at five markets, 1918–1927*

NEW YORK

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
	1,000 lbs.	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
Av. 1921–1925	3,064	2,954	3,531	3,772	4,480	5,346	5,821	4,441	4,052	4,015	3,689	2,962	48,127
1918	5,256	3,518	2,657	2,844	3,899	5,951	6,687	4,956	3,670	5,123	3,833	4,156	50,550
1919	3,479	3,173	4,393	5,114	7,008	7,075	6,972	5,428	7,121	6,367	4,621	4,294	65,045
1920	3,337	2,431	3,803	1,398	4,693	6,152	5,703	5,278	3,483	3,208	3,756	3,762	47,004
1921	3,274	3,337	2,883	4,068	6,003	5,856	6,655	4,772	4,308	4,415	3,657	2,753	51,981
1922	2,739	2,775	4,063	4,466	5,047	6,376	5,379	4,642	3,942	3,866	3,607	3,207	50,109
1923	2,908	3,385	4,341	4,196	4,610	5,207	6,110	4,757	3,845	3,791	3,544	2,731	49,425
1924	3,299	2,859	3,367	3,050	3,609	4,706	5,235	3,042	3,594	3,333	3,684	3,181	42,959
1925	3,098	2,412	3,002	3,080	3,132	4,585	5,728	4,993	4,571	4,671	3,952	2,939	46,163
1926	3,255	2,570	3,476	3,270	3,685	5,476	5,101	3,922	3,834	4,149	3,326	3,299	45,363
1927	2,847	2,844	3,284	3,505	3,502	4,814	5,228	4,824	5,108	4,398	3,367	3,216	46,937

CHICAGO

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Av. 1921–1925	7,398	7,512	8,629	8,822	10,699	12,525	11,833	11,293	9,915	10,599	8,480	7,970	115,674
1918	------	------	6,202	5,549	4,957	7,614	8,536	6,674	6,016	5,698	4,634	5,019	------
1919	5,925	4,854	5,495	6,287	7,833	9,778	8,539	8,323	7,362	6,648	5,073	4,902	81,019
1920	5,328	5,100	7,069	5,067	7,744	11,194	9,183	6,599	5,707	6,255	6,795	5,556	81,597
1921	6,042	5,423	7,147	6,840	9,290	9,832	7,112	6,930	6,734	8,091	6,147	6,261	85,849
1922	5,940	6,139	8,093	7,875	10,262	11,384	10,121	10,669	9,419	10,452	8,893	8,477	107,724
1923	7,775	7,243	8,124	9,053	10,745	15,039	13,874	11,750	10,652	12,608	9,216	7,566	123,645
1924	8,135	10,358	10,267	10,601	11,949	12,337	14,204	12,943	11,516	10,264	8,341	9,109	130,024
1925	9,100	8,398	9,513	9,740	11,249	14,032	13,853	14,171	11,254	11,582	9,801	8,436	131,129
1926	8,633	8,446	8,597	9,119	7,410	10,092	11,280	11,806	10,155	10,219	9,647	9,700	115,104
1927	7,170	9,104	9,145	10,210	13,263	11,940	13,139	12,557	11,915	9,918	7,487	7,785	123,633

PHILADELPHIA

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Av. 1921–1925	1,093	1,052	1,255	1,216	1,655	2,166	2,179	1,945	1,888	2,013	1,393	1,065	18,920
1918	------	------	642	629	1,228	1,148	2,315	1,389	940	1,262	706	877	------
1919	539	881	1,529	1,654	1,965	2,226	2,152	1,704	1,740	2,887	2,930	1,185	21,392
1920	874	1,040	1,489	626	1,743	2,104	1,657	2,189	1,362	1,130	1,431	1,221	16,866
1921	1,116	1,064	1,280	1,396	2,223	2,602	2,491	2,311	2,086	1,920	1,369	1,094	20,952
1922	1,144	1,120	1,506	1,523	1,750	1,827	1,846	1,887	1,815	2,101	1,738	1,067	19,324
1923	964	982	1,236	1,297	1,361	1,915	2,114	2,000	1,972	2,217	1,310	995	18,363
1924	1,000	1,086	1,188	897	1,092	1,850	2,061	1,704	1,660	1,978	1,218	1,132	16,866
1925	1,239	1,009	1,067	969	1,847	2,635	2,383	1,825	1,905	1,848	1,331	1,037	19,095
1926	1,247	1,112	1,076	1,188	1,535	2,513	2,191	1,852	2,132	2,078	1,306	1,224	19,454
1927	1,140	1,409	1,047	1,290	2,041	2,357	2,409	1,899	2,027	2,183	1,362	1,232	20,396

BOSTON

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Av. 1921–1925	641	587	735	925	1,187	2,057	2,056	1,452	1,368	1,470	1,097	762	14,336
1918	------	------	647	453	1,462	2,559	2,305	1,721	972	778	574	476	------
1919	351	517	1,100	1,088	2,000	2,374	2,898	2,091	1,422	1,859	1,231	791	17,722
1920	620	274	622	511	948	1,422	2,290	1,749	1,343	1,479	1,256	483	12,997
1921	435	574	691	685	978	2,503	1,701	1,173	1,262	1,456	1,249	501	13,208
1922	408	590	663	1,004	1,201	2,220	1,963	1,461	1,410	1,104	910	587	13,521
1923	828	436	947	1,029	1,195	2,074	2,304	1,936	1,165	1,777	1,302	921	15,914
1924	740	845	672	927	1,341	1,914	2,064	1,204	1,248	993	927	850	13,725
1925	792	492	704	980	1,218	1,576	2,248	1,484	1,755	2,018	1,097	950	15,314
1926	868	910	1,095	808	1,075	2,066	1,884	1,858	1,486	1,430	1,053	904	15,437
1927	834	857	694	796	1,211	1,654	1,736	1,919	1,347	1,466	1,162	912	14,588

SAN FRANCISCO

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Av. 1921–1925	682	714	717	777	985	1,090	1,364	1,201	853	865	827	688	10,763
1918	------	------	------	------	------	------	693	1,372	785	935	651	764	------
1919	694	846	869	1,219	1,263	1,195	1,706	871	874	730	795	1,027	12,089
1920	935	810	935	981	1,012	1,002	964	601	936	852	564	611	10,203
1921	621	885	757	963	867	887	1,365	813	533	771	806	364	9,632
1922	503	634	464	697	886	963	902	1,147	877	800	551	733	9,157
1923	588	571	706	858	1,052	1,171	1,362	1,237	985	932	1,185	1,043	11,690
1924	725	944	1,046	700	1,039	1,234	1,579	1,103	837	911	714	650	11,482
1925	973	534	612	667	1,083	1,197	1,613	1,703	1,035	910	878	650	11,855
1926	850	530	811	1,146	1,267	1,630	1,517	1,298	1,177	823	622	859	12,530
1927	716	702	786	1,121	1,284	1,369	1,622	1,357	1,125	1,031	900	681	12,694

TABLE 443.—*Cheese: Gross receipts at five markets, 1918–1927*—Continued

TOTAL

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
	1,000 lbs.	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
Av. 1921–1925	12, 877	12, 819	14, 868	15, 512	19, 006	23, 184	23, 253	20, 331	18, 076	18, 962	15, 485	13, 447	207, 821
1918	------	------	------	------	------	------	20, 536	16, 112	12, 383	13, 796	10, 398	11, 292	------
1919	10, 988	10, 271	13, 386	15, 362	20, 069	22, 648	22, 267	18, 417	18, 519	18, 491	14, 650	12, 199	197, 267
1920	11, 094	9, 655	13, 918	8, 583	16, 140	21, 874	19, 797	16, 416	12, 831	12, 924	13, 802	11, 633	168, 667
1921	11, 488	11, 283	12, 758	13, 952	19, 361	21, 680	19, 324	15, 999	14, 923	16, 653	13, 228	10, 973	181, 622
1922	10, 734	11, 258	14, 789	15, 565	19, 146	22, 770	20, 211	19, 806	17, 463	18, 323	15, 699	14, 071	199, 835
1923	13, 063	12, 617	15, 354	16, 433	18, 963	25, 406	25, 764	21, 680	18, 619	21, 325	16, 557	13, 256	219, 037
1924	13, 899	16, 092	16, 540	16, 175	19, 030	22, 041	25, 143	19, 996	18, 855	17, 479	14, 884	14, 922	215, 056
1925	15, 202	12, 845	14, 898	15, 436	18, 529	24, 025	25, 825	24, 176	20, 520	21, 029	17, 059	14, 012	223, 556
1926	14, 853	13, 568	15, 055	15, 531	14, 972	21, 777	21, 973	20, 736	18, 784	18, 699	15, 954	15, 986	207, 888
1927	12, 707	14, 916	14, 956	16, 922	21, 301	22, 134	24, 134	22, 556	21, 522	18, 996	14, 278	13, 826	218, 248

Bureau of Agricultural Economics. Compiled from reports of bureau representatives in the various markets.

TABLE 444.—*Cheese: Gross receipts at five markets, by State of origin, 1921–1927*

NEW YORK

State	1921	1922	1923	1924	1925	1926	1927
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
New York	22, 413	21, 770	16, 909	14, 478	14, 107	11, 180	11, 867
Wisconsin	17, 044	16, 100	19, 758	16, 339	18, 978	17, 587	19, 258
Illinois	7, 061	6, 997	8, 535	8, 382	7, 211	7, 406	7, 231
Pennsylvania	1, 623	1, 181	955	618	1, 105	745	434
Michigan	787	506	619	644	472	301	440
Ohio	773	632	321	136	374	363	587
Massachusetts	420	189	228	235	248	244	189
Indiana	187	182	277	581	2, 075	5, 653	3, 833
Nebraska	144	23	4	240	48	76	150
Missouri	131	315	170	48	98	158	287
Minnesota	112	494	249	352	118	551	279
New Jersey	97	46	40	48	16	18	204
Iowa	57	94	206	295	777	346	421
Virginia	24	5	4	49	23	12	3
Tennessee	15	74	3	8	15	13	1
Vermont	14	97	305	79	273	47	3
Other States	625	215	414	172	85	78	279
Canada	454	1, 189	428	255	140	585	1, 471
Total	51, 981	50, 109	49, 425	42, 959	46, 163	45, 363	46, 937

BOSTON

State	1921	1922	1923	1924	1925	1926	1927
New York	5, 868	6, 527	7, 402	5, 209	4, 546	4, 328	2, 831
Wisconsin	3, 294	3, 091	3, 392	4, 317	7, 787	6, 229	7, 170
Illinois	1, 782	2, 091	3, 881	2, 931	1, 782	3, 622	3, 261
Vermont	1, 444	471	623	736	432	413	124
Pennsylvania	132	136	183	181	206	152	197
Ohio	71	35	23	137	201	162	196
New Hampshire	55	75	50	41	6	5	2
Massachusetts	39	32	27	13	8	5	41
Indiana	36	66	28	1	47	60	170
Maine	35	17	38	5	4	114	143
Michigan	31	296	191	74	198	184	200
Other States	142	475	71	23	97	162	221
Canada	279	209	5	56	------	1	32
Total	13, 208	13, 521	15, 914	13, 724	15, 314	15, 437	14, 588

TABLE 444.—*Cheese: Gross receipts at five markets, by State of origin, 1921–1927*—Continued

CHICAGO

State	1921	1922	1923	1924	1925	1926	1927
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Wisconsin	76,706	95,656	110,648	117,439	119,244	100,676	100,504
Illinois	3,102	4,011	4,497	3,965	4,592	3,293	2,996
Minnesota	2,687	1,960	3,177	2,733	3,108	3,265	2,503
Michigan	1,687	1,415	729	1,241	118	238	550
Montana	313	26	203	311	81		66
Iowa	287	810	705	620	606	457	263
New York	221	2,391	2,429	1,667	1,282	2,218	3,489
Kansas	166	3	51	30	45	72	26
Pennsylvania	163	308	289	158	115	112	532
California	113	57			9	94	3
Ohio	99	301	147	91	745	315	532
South Dakota	78	17	16	64	2	106	138
Missouri	56	222	83	188	65	43	122
Texas	32	9	15	2	38	35	12
Colorado	27	104	16	34	192	42	31
Indiana	16	22	66	50	49	93	43
Utah	11	8	14	7	8	2	36
New Jersey		45	24	95	32		41
Idaho		19	168	675	337	534	88
Other States	85	90	122	281	81	250	916
Canada		250	246	373	380	3,259	1,742
Total	85,849	107,724	123,645	130,024	131,129	115,104	123,633

PHILADELPHIA

State	1921	1922	1923	1924	1925	1926	1927
Wisconsin	8,487	10,638	8,884	8,003	10,850	11,428	12,723
New York	7,068	4,660	4,538	3,655	3,627	2,630	2,462
Illinois	2,557	2,955	4,126	4,333	4,073	4,636	3,704
Pennsylvania	2,041	517	245	240	84	63	41
Ohio	205	223	136	26	11	133	86
New Jersey	121	14	36	3	3		9
Indiana	100	95	142	95	201	122	115
Michigan	45	115	131	199	111	188	634
Minnesota	41	1	54		68	184	416
Iowa	3	25	44	164	37	1	3
Other States	284	73	27	148	30	69	77
Canada		8	(1)	(1)			126
Total	20,952	19,324	18,363	16,866	19,095	19,454	20,396

SAN FRANCISCO

State	1921	1922	1923	1924	1925	1926	1927
California	4,800	3,416	3,650	2,603	2,316	2,123	2,515
Oregon	2,245	2,448	2,557	2,710	3,029	3,148	3,273
Wisconsin	1,064	1,353	1,979	2,216	1,987	2,694	2,198
Illinois	505	855	1,441	821	463	222	192
New York	388	314	249	310	307	529	506
Colorado	176	322	222	256	323	294	241
Washington	145	108	112	58	120	50	91
Idaho	139	222	1,039	2,262	2,835	2,858	3,331
Utah	24	10	17	76	164	387	199
Montana		56	338	5	64	79	1
Minnesota			63	152	154	94	24
Other States	146	53	23	13	93	52	33
Total	9,632	9,157	11,690	11,482	11,855	12,530	12,694

Bureau of Agricultural Economics. Compiled from reports of bureau representatives in the various markets.

[1] Not over 500 pounds.

TABLE 445.—*American cheese: Cold-storage holdings, United States, 1915–1927* [1]

Year	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sept. 1	Oct. 1	Nov. 1	Dec. 1
	1,000 lbs.	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
Average:												
1916–1920	40, 038	31, 287	22, 110	15, 286	11, 040	13, 060	29, 545	52, 425	66, 219	63, 736	55, 731	48, 060
1921–1925	38, 835	31, 016	24, 597	19, 103	18, 152	21, 505	39, 324	55, 240	63, 428	61, 751	56, 313	50, 330
1915	------	------	------	------	------	------	------	------	28, 575	24, 144	32, 428	31, 271
1916	28, 558	18, 908	13, 373	8, 443	6, 546	7, 301	16, 357	31, 569	46, 776	49, 579	45, 713	37, 080
1917	31, 855	22, 113	15, 560	9, 842	7, 928	11, 626	34, 159	67, 595	91, 545	90, 671	78, 087	75, 166
1918	66, 784	56, 298	37, 743	27, 965	17, 736	20, 395	30, 054	48, 804	55, 742	42, 065	33, 402	25, 625
1919	19, 823	15, 486	9, 837	6, 750	6, 027	12, 478	37, 501	62, 645	76, 661	81, 359	72, 889	62, 508
1920	53, 168	43, 631	34, 039	23, 431	16, 963	13, 502	29, 654	51, 512	60, 372	55, 007	48, 566	39, 921
1921	34, 115	25, 000	17, 477	14, 294	13, 466	17, 814	34, 948	41, 284	46, 635	45, 163	42, 969	34, 055
1922	27, 691	21, 430	15, 006	10, 745	10, 868	15, 481	33, 130	46, 580	53, 625	49, 473	40, 852	37, 291
1923	33, 617	26, 593	20, 693	14, 465	14, 077	17, 507	36, 834	55, 839	63, 960	62, 384	57, 927	55, 105
1924	49, 566	40, 506	35, 160	28, 294	26, 202	27, 172	45, 239	65, 864	76, 406	73, 153	67, 905	58, 705
1925	49, 187	41, 552	34, 647	27, 716	26, 147	29, 550	46, 468	66, 634	76, 512	78, 582	71, 913	66, 495
1926	58, 457	50, 339	42, 587	38, 041	35, 597	39, 346	54, 069	73, 681	81, 297	77, 646	72, 491	63, 881
1927	54, 596	46, 026	39, 382	35, 193	32, 487	35. 826	49, 999	67, 091	69, 749	65, 453	59, 035	53, 447

Bureau of Agricultural Economics. Compiled from reports from cold-storage establishments.

[1] The term "American cheese" is intended to cover only those varieties known as twins, flats, daisies, Cheddars, longhorns, and square prints. It does not, therefore, include all kinds of cheese made-in America.

TABLE 446.—*Cheese: International trade, average 1909–1913, annual 1923–1926*

Country	Year ended Dec. 31									
	Average 1909–1913		1923		1924		1925		1926, preliminary	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
PRINCIPAL EXPORTING COUNTRIES	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
Argentina	10, 447	[1] 6	2, 359	11, 670	2, 546	3, 461	3, 402	657	3, 431	866
Australia	360	799	[2] 1, 422	[2] 3, 788	[2] 357	[2] 10,354	[3] 550	[3] 9, 549	[3] 1, 859	[3] 4, 803
Bulgaria	[4] 52	[1] 5, 972	34	1, 175	16	258	(5)	191	[3] 42	186
Canada	1, 054	167, 260	1, 900	116, 202	909	121, 466	10, 274	150, 743	1, 219	134, 657
Czechoslovakia	------	------	1, 999	3, 917	1, 671	5, 431	1, 777	8, 048	1, 964	7, 732
Denmark	1, 414	527	721	12, 038	673	19, 480	819	18, 783	1, 427	15, 345
Finland	478	2, 086	23	2, 944	36	5, 613	33	8, 421	62	6, 364
Hungary	------	------	(5)	1, 160	1	1, 344	1, 923	1, 769	1, 626	1, 834
Italy	13, 308	60, 560	10, 228	50, 476	4, 156	74, 110	3, 868	86, 228	7, 933	72, 888
Netherlands	522	127, 379	873	136, 646	888	170, 352	1, 163	175, 711	1, 081	185, 706
New Zealand	3	55, 561	(5)	161, 444	19	178, 582	2	154, 196	1	163, 693
Russia	3, 911	7, 011	------	[3] 199	[8] 58	[3] 303	[8] 289	[8] 14	------	------
Switzerland	7, 150	70, 075	2, 543	39, 046	4, 163	43, 776	3, 765	51, 726	3, 456	61, 972
Yugoslavia [3]	------	------	[3] 118	9, 309	191	7, 439	265	4, 595	342	4, 180
PRINCIPAL IMPORTING COUNTRIES										
Algeria	6, 592	138	7, 415	189	7, 547	174	7, 897	278	5, 464	[3] 234
Austria	[6] 12, 298	[6] 966	9, 847	317	10, 142	1, 189	7, 970	681	7, 665	1, 376
Belgium	31, 771	354	39, 553	1, 039	37, 388	1, 633	38, 274	1, 807	33, 217	1, 237
Brazil	4, 178	[1] 1	254	3	646	1	1, 101	(5)	1, 545	(5)
British India	1, 314	------	1, 006	------	1, 046	[3] 4	1, 157	------	1, 190	------
Cuba	4, 520	7	4, 995	3	5, 619	8	5, 499	3	4, 463	2
Dutch East Indies	757	------	1, 242	------	1, 383	------	[7] 1, 362	------	[7] 1, 484	------
Egypt	8, 182	[8] 48	6, 007	122	5, 960	117	7, 157	155	6, 842	79
France	49, 056	26, 880	45, 690	27, 008	32, 792	28, 891	34, 064	29, 978	34, 666	31, 481
Germany	48, 687	1, 967	24, 930	636	96, 702	1, 239	148, 699	2, 491	141, 345	2, 320
Irish Free State	------	------	------	------	2, 590	542	2, 823	483	2, 740	403
Norway	663	377	1, 962	697	1, 106	737	1, 301	702	1, 266	757
Spain	5, 032	53	5, 971	126	6, 599	87	5, 307	133	7, 023	79
Sweden	946	41	4, 189	114	2, 210	266	1, 214	730	1, 375	656
Tunis	1, 382	19	[3] 1, 031	[3] 40	1, 073	48	1, 185	10	1, 125	22
Union of South Africa	4, 991	3	832	118	552	127	256	190	344	114
United Kingdom	257, 407	950	313, 280	946	318, 041	843	331, 500	1, 950	333, 187	2, 994
United States	46, 346	5, 142	64, 420	8, 331	59, 176	4, 299	62, 403	9, 190	78, 417	3, 903
Total, 32 countries	522, 821	534, 182	554, 844	590, 603	606, 256	682, 174	687, 299	719, 412	687, 801	705, 883

Bureau of Agricultural Economics. Official sources except where otherwise noted. All cheese made from milk, including "cottage cheese."

[1] 4-year average.
[2] Year beginning July 1.
[3] International Yearbook of Agricultural Statistics.
[4] 3-year average.
[5] Less than 500 pounds.
[6] Average for Austria-Hungary
[7] Java and Madura only.
[8] 1 year only.

TABLE 447.—*Cheese, No. 1 American fresh flats: Average wholesale price per pound, New York, 1910–1927*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
Average: 1914–1920	23	23	23	23	23	22	22	22	23	24	24	25	23
Average: 1921–1925	24	23	23	21	19	20	22	23	23	-----	-----	-----	-----
1910	17	17	17	17	14	14	15	15	15	15	15	16	16
1911	15	15	14	14	11	11	12	12	14	14	15	16	14
1912	16	17	18	19	15	14	15	16	16	18	17	17	16
1913	17	17	16	15	13	14	14	15	16	16	16	16	15
1914	17	16	18	16	14	15	15	16	16	15	15	15	16
1915	15	16	16	16	17	15	15	13	14	15	16	17	15
1916	17	18	18	18	18	15	15	17	19	21	23	24	19
1917	24	25	26	26	26	23	24	23	25	25	23	24	24
1918	24	26	24	23	24	23	25	26	28	33	32	35	27
1919	35	30	32	31	32	32	33	31	31	31	32	32	32
1920	32	30	29	30	30	28	27	27	28	28	28	28	29
1921	24	21	25	22	17	16	19	21	21	22	21	21	21
1922	21	20	20	18	17	19	21	21	21	-----	-----	-----	-----
1923	28	28	25	23	23	24	25	25	26	26	25	-----	-----
1924	22	22	21	17	17	20	21	21	22	20	21	23	21
1925	24	24	24	23	21	23	24	25	25	26	27	27	24
1926	-----	24	23	21	20	22	23	23	24	25	-----	-----	-----
1927	-----	-----	23	-----	23	24	25	26	27	28	-----	-----	-----

Bureau of Agricultural Economics. January, 1910–February, 1919, compiled from Urner-Barry reports; subsequently from reports of bureau representatives in the market.

TABLE 448.—*Oleomargarine: Production and consumption in the United States, 1909–1927*

Year ended June 30	Production			Stocks beginning of year	Exports	Stocks end of year	Consumption	
	Colored	Uncolored	Total				Total	Per capita
	1,000 lbs.	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*Lbs.*
1909	5,710	86,573	92,283	692	2,889	748	89,338	0.99
1910	6,177	135,685	141,862	748	3,419	1,165	138,026	1.51
1911	5,831	115,332	121,163	1,165	3,795	942	117,591	1.26
1912	6,236	122,365	128,601	942	3,627	1,249	124,667	1.32
1913	6,521	138,707	145,228	1,249	2,968	1,651	141,858	1.48
1914	6,384	137,637	144,021	1,651	2,533	1,261	141,878	1.46
1915	7,595	138,215	145,810	1,261	5,252	1,662	140,157	1.42
1916	6,749	145,761	152,510	1,662	5,426	1,993	146,753	1.47
1917	8,012	225,158	233,170	1,993	5,651	2,988	226,524	2.23
1918	6,595	319,934	326,529	2,988	6,310	3,578	319,629	3.11
1919	13,849	345,368	359,217	3,578	18,570	2,563	341,662	3.28
1920	15,624	375,659	391,283	2,563	20,952	4,110	368,784	3.49
1921	11,601	269,481	281,082	4,110	6,219	1,980	276,993	2.58
1922	6,604	184,346	190,950	1,980	2,143	2,266	188,521	1.73
1923	8,260	200,922	209,182	2,266	3,764	2,647	205,037	1.85
1924	11,548	228,151	239,699	2,647	1,396	2,607	238,343	2.11
1925	11,280	204,123	215,403	2,607	887	2,720	214,403	1.87
1926	13,181	234,866	248,047	2,720	1,256	2,942	246,569	2.12
1927	14,502	242,655	257,157	2,942	942	3,299	255,858	2.17

Bureau of Agricultural Economics. Production and stocks from reports of the Bureau of Internal Revenue. Exports from reports of the Bureau of Foreign and Domestic Commerce.

TABLE 449.—*Oleomargarine: Materials used in manufacture, 1917–1926*

Material	Year beginning July—									
	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Oleo oil	96,378	97,464	89,842	49,676	40,980	46,645	52,265	44,102	47,418	48,741
Coconut oil	61,773	69,640	80,784	103,112	57,394	65,656	83,059	79,449	98,307	107,654
Cottonseed oil	36,454	37,846	39,450	18,533	15,420	18,757	20,640	20,966	25,608	23,372
Milk	61,128	68,000	76,000	79,716	53,939	59,835	69,090	61,924	72,662	73,700
Peanut oil	21,593	38,764	48,346	16,332	11,625	6,922	5,656	4,392	5,257	4,872
Salt	18,279	21,432	24,864	25,365	16,262	17,998	20,593	18,725	20,593	21,683
Oleo stearine	3,427	2,456	2,132	4,858	4,574	4,815	5,317	5,250	5,314	5,145
Neutral lard	45,702	45,764	38,456	29,268	27,057	29,568	32,210	25,674	25,172	24,872
Oleo stock	7,526	6,342	5,804	2,065	2,143	2,322	2,756	3,183	3,082	2,552
Butter	4,548	5,680	6,845	1,499	1,107	1,576	1,900	1,509	2,330	2,070
Corn oil	60	40	35	926			457	196	174	183
Soy-bean oil				461					1	33
Edible tallow				233			24	111	93	219
Mustard-seed oil				110			38	27	34	53
Coloring				26	11	11	26	38	41	18
Miscellaneous	14	11	14	9,776	3,417	2,918	432	688	1,374	918
Total	356,882	393,439	412,572	341,956	233,929	257,023	294,463	266,234	307,460	316,085

Bureau of Agricultural Economics. 1917–1919, Institute of Margarin Manufacturers; 1920–1926, annual reports of the Bureau of Internal Revenue.

TABLE 450.—*Oleomargarine, standard, uncolored: Monthly average wholesale price per pound, Chicago, 1914–1927*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
Average:	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1914–1920	24.6	24.4	24.1	24.4	25.0	25.0	24.9	24.9	25.3	25.4	26.1	26.1	25.0
1921–1925	22.3	21.7	21.3	20.7	20.4	20.1	20.5	21.3	21.4	21.6	22.0	22.3	21.3
1914	18.0	18.0	18.0	17.0	17.0	17.0	17.0	17.0	18.0	18.0	18.0	18.0	17.6
1915	18.0	18.0	18.0	18.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.3
1916	17.0	17.0	17.0	18.0	19.0	19.0	19.0	19.0	19.0	20.0	22.0	24.0	19.2
1917	22.5	22.5	22.5	24.5	25.5	25.5	25.5	25.5	26.5	28.5	28.5	28.5	25.5
1918	28.5	28.5	28.5	28.5	28.5	28.5	28.5	29.5	29.5	30.5	32.5	32.5	29.5
1919	32.5	32.5	31.5	31.5	34.5	35.5	35.5	35.5	36.5	34.5	35.5	35.5	34.3
1920	35.5	34.4	33.5	33.5	33.5	32.6	31.7	30.5	30.5	29.5	29.5	27.0	31.8
1921	24.9	23.6	22.2	20.5	19.8	18.5	18.9	20.5	20.5	20.5	20.1	19.5	20.8
1922	19.0	17.5	17.5	17.5	17.5	17.5	18.2	18.5	18.5	18.5	19.2	20.5	18.3
1923	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	21.0	21.5	22.2	22.5	20.9
1924	22.5	22.5	21.9	20.5	20.5	20.5	21.2	22.5	22.5	23.0	24.0	24.5	22.2
1925	24.5	24.5	24.5	24.5	23.9	23.5	23.7	24.5	24.5	24.5	24.5	24.5	24.3
1926	24.5	24.3	23.5	23.3	22.5	22.5	22.5	22.5	22.5	22.5	21.8	21.5	22.8
1927	21.5	21.5	21.5	21.5	21.5	21.5	21.5	21.5	23.9	24.5	23.5	23.5	22.3

Bureau of Agricultural Economics. Compiled from Bureau of Labor Statistics Wholesale Price Bulletins.

TABLE 451.—*Percentage of farms reporting chicken flocks of various sizes, in selected counties, January 1, 1925*

EASTERN STATES

State	County	Farms reporting chickens	Farms reporting flocks of various sizes					
			1 to 25 chickens	26 to 75 chickens	76 to 175 chickens	176 to 450 chickens	451 to 900 chickens	901 and over chickens
		Number	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Maine	Cumberland	2,519	33.6	45.3	15.0	5.3	0.7	0.1
New Hampshire	Hillsborough	2,120	27.5	37.7	18.5	10.8	3.8	1.7
Vermont	Washington	1,868	42.9	46.6	7.7	2.6	.2	-------
Massachusetts	Bristol	2,574	33.1	37.3	17.2	9.2	2.8	.4
Rhode Island	Washington	733	17.2	46.0	22.1	10.8	3.5	.4
Connecticut	Tolland	1,738	31.9	44.8	13.3	6.8	2.5	.7
New York	Suffolk	1,904	13.3	46.8	19.6	12.6	4.4	3.3
	Ulster	3,332	18.7	39.6	22.7	14.0	4.3	.7
	Cayuga	3,653	11.8	44.3	32.0	10.2	1.5	.2
New Jersey	Hunterdon	2,381	4.3	20.7	34.3	32.0	7.4	1.3
	Cumberland	2,853	21.9	31.0	16.9	14.8	10.2	5.2
Pennsylvania	York	7,581	5.0	28.0	39.6	24.0	3.0	.4
	Bedford	4,491	12.5	44.2	27.1	13.7	2.2	.3
Delaware	Sussex	4,863	6.1	26.0	38.2	24.4	4.2	1.1
Maryland	Howard	1,184	13.9	36.6	36.3	11.2	1.6	.4
West Virginia	Jackson	2,409	6.5	44.2	43.1	6.1	.1	-------
Virginia	Rockingham	3,503	8.5	36.6	38.0	15.2	1.5	.2

MIDDLE WESTERN STATES

State	County	Farms reporting chickens	1 to 25 chickens	26 to 75 chickens	76 to 175 chickens	176 to 450 chickens	451 to 900 chickens	901 and over chickens
Ohio	Hardin	2,408	3.8	34.1	49.9	12.0	0.1	0.1
	Morgan	1,948	6.8	45.6	38.8	8.4	.4	-------
Indiana	Wells	2,288	4.0	30.7	49.4	15.3	.5	.1
	Crawford	1,530	7.2	46.8	36.5	9.1	.3	.1
Kentucky	Madison	3,036	19.2	53.6	23.9	3.2	.1	-------
	Kenton	1,099	12.4	60.8	23.1	3.3	.3	.1
Illinois	Wayne	3,328	2.1	14.1	44.6	37.9	1.2	.1
	Logan	2,047	2.8	23.2	53.4	19.9	.6	.1
	Grundy	1,366	3.2	26.5	57.7	12.5	.1	-------
Missouri	Lawrence	2,919	7.0	36.0	46.0	10.7	.3	-------
	Grundy	1,731	4.7	21.2	46.5	27.1	.4	.1
	Montgomery	1,798	2.4	13.0	39.7	43.9	.9	.1
Kansas	McPherson	2,310	2.4	13.6	45.3	37.6	1.1	-------
	Franklin	2,083	3.6	18.8	44.3	32.0	1.2	.1
Nebraska	Saline	1,958	3.4	20.2	48.4	26.9	.9	.2
Iowa	Bremer	2,007	1.4	11.1	39.1	46.7	1.7	-------
	Polk	2,686	8.6	29.8	42.9	18.0	.5	.2
South Dakota	McCook	1,308	2.0	15.9	42.7	38.3	1.0	.1
North Dakota	Richland	2,238	5.2	32.2	48.5	13.8	.3	-------
Minnesota	Wright	3,727	6.0	39.8	44.8	9.2	.2	-------
	Hennepin	3,585	14.5	50.2	28.7	6.0	.5	.1
	Freeborn	2,620	2.5	18.8	53.4	24.7	.6	-------
Wisconsin	Dane	5,634	4.7	37.6	47.9	9.5	.3	-------
	Milwaukee	1,875	18.4	59.5	18.8	2.9	.4	-------
	Trempealeau	3,005	5.1	43.1	43.4	8.3	.1	-------
Michigan	Hillsdale	3,570	8.2	35.0	45.5	10.9	.4	-------
	Tuscola	4,289	13.1	55.4	28.5	2.8	.2	-------

SOUTHERN STATES

State	County	Farms reporting chickens	1 to 25 chickens	26 to 75 chickens	76 to 175 chickens	176 to 450 chickens	451 to 900 chickens	901 and over chickens
North Carolina	Forsythe	2,762	35.6	56.7	6.7	1.0	-------	-------
Tennessee	Overton	2,573	24.1	61.8	13.7	.4	-------	-------
	Greene	5,214	12.9	52.0	27.9	6.4	0.6	0.2
South Carolina	Lexington	3,698	45.7	48.0	5.2	.9	.1	.1
	Orangeburg	5,992	68.4	27.0	4.2	.4	-------	-------
	Berkeley	2,433	82.9	15.7	1.2	.2	-------	-------
Georgia	Sumter	1,665	64.2	30.2	4.0	1.2	.3	.1
	Fulton	880	52.8	39.5	6.0	1.5	.2	-------
Florida	Hillsborough	1,912	33.0	44.0	16.7	5.5	.7	.1
	Marion	2,011	55.4	36.3	6.8	1.1	.2	.2
	Jackson	3,302	44.9	47.2	7.4	.4	.1	-------
Alabama	Fayette	2,349	47.1	51.4	1.4	.1	-------	-------
	Pike	3,968	64.4	33.9	1.4	.3	-------	-------
	Marshall	4,685	37.8	58.2	3.8	.2	-------	-------
Louisiana	Lafayette	2,841	31.0	48.2	19.6	1.2	-------	-------
Oklahoma	Oklahoma	2,884	20.7	42.3	26.2	9.9	.5	.4
Texas	Dallas	4,517	25.1	53.9	16.6	3.7	.5	.2
	Fayette	4,375	10.4	37.0	39.9	12.6	.1	-------
Mississippi	Lee	3,988	42.2	51.9	5.6	.3	-------	-------
	Noxubee	3,362	82.4	15.9	1.7	-------	-------	-------
	Jones	2,536	44.7	49.7	4.7	.7	.2	-------
Arkansas	Lonoke	4,098	45.7	46.2	7.3	.8	-------	-------

TABLE 451.—*Percentage of farms reporting chicken flocks of various sizes, in selected counties, January 1, 1925*—Continued

FAR WESTERN STATES

State	County	Farms reporting chickens	Farms reporting flocks of various sizes					
			1 to 25 chickens	26 to 75 chickens	76 to 175 chickens	176 to 450 chickens	451 to 900 chickens	901 and over chickens
		Number	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Montana	Gallatin	922	11.2	49.9	31.7	7.0	0.2	
	Chouteau	1,302	14.2	52.5	30.6	2.7		
Idaho	Canyon	2,639	16.1	45.1	28.7	9.1	.9	0.1
Wyoming	Sheridan	738	13.8	49.2	30.3	6.4	.3	
	Converse	663	23.4	49.5	23.5	3.6		
Colorado	Adams	1,610	18.3	45.8	26.6	8.8	.4	.1
	Otero	1,214	16.1	47.9	27.5	6.8	1.3	.4
Utah	Salt Lake	1,756	31.8	43.9	12.1	7.0	3.0	2.2
Nevada	Douglas	145	4.8	40.7	40.0	12.4	.7	1.4
Arizona	Maricopa	3,072	25.4	41.9	19.2	10.1	2.3	1.1
New Mexico	Curry	1,030	7.2	38.4	41.9	12.2	.1	.2
Washington	King	3,882	36.0	32.9	11.4	9.7	6.2	3.8
	Whatcom	2,995	34.1	27.5	12.7	14.9	8.4	2.4
	Walla Walla	1,196	25.4	44.6	22.0	6.6	.9	.5
Oregon	Clackamas	4,083	28.0	45.2	17.9	6.7	1.5	.7
California	Sonoma	5,181	25.9	27.2	8.5	7.7	9.6	21.1
	Los Angeles	5,823	30.6	27.7	10.0	11.2	10.4	10.1

Bureau of Agricultural Economics; special tabulation of data collected by Census Bureau.

TABLE 452.—*Percentage of eggs produced by chicken flocks of various sizes in selected counties, 1924*

EASTERN STATES

State	County	Eggs produced	Size of chicken flocks reported					
			1 to 25 chickens	26 to 75 chickens	76 to 175 chickens	176 to 450 chickens	451 to 900 chickens	901 and over chickens
		1,000 dozens	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Maine	Cumberland	1,026	8.8	29.2	29.5	23.3	7.3	1.9
New Hampshire	Hillsborough	1,668	4.6	16.2	20.2	24.5	18.0	16.5
Vermont	Washington	587	17.0	45.4	17.7	17.7	2.2	
Massachusetts	Bristol	2,051	5.3	17.4	20.4	25.8	23.5	7.6
Rhode Island	Washington	463	2.5	19.7	21.0	26.6	23.5	6.7
Connecticut	Tolland	1,025	6.2	21.0	16.4	25.3	19.9	11.2
New York	Suffolk	2,460	1.7	12.6	11.4	19.6	17.8	36.9
	Ulster	3,152	2.8	16.3	21.4	30.1	22.2	7.2
	Cayuga	2,009	2.2	21.7	33.2	28.4	11.2	3.3
New Jersey	Hunterdon	3,063	.4	5.5	19.8	37.8	25.6	10.9
	Cumberland	5,542	1.0	4.0	6.0	17.5	33.3	38.2
Pennsylvania	York	6,898	.6	9.6	30.1	40.9	13.5	5.3
	Bedford	3,739	2.0	18.2	27.3	35.0	12.5	5.0
Delaware	Sussex	3,769	.6	6.7	22.8	36.1	21.3	12.5
Maryland	Howard	547	2.0	15.7	40.2	25.8	13.1	3.2
West Virginia	Jackson	1,568	1.5	25.2	55.4	16.9	1.0	
Virginia	Rockingham	2,062	1.0	14.5	38.1	34.8	9.0	2.6

MIDDLE WESTERN STATES

Ohio	Hardin	1,120	0.6	17.4	54.9	26.7	0.2	0.2
	Morgan	1,107	1.3	25.4	47.5	22.2	2.9	.7
Indiana	Wells	1,409	.9	16.6	49.9	29.0	1.8	1.8
	Crawford	750	1.4	26.5	47.3	22.8	2.0	
Kentucky	Madison	591	5.3	43.0	42.1	9.6		
	Kenton	413	3.1	44.1	34.1	11.8	4.9	2.0
Illinois	Wayne	3,102	.2	4.1	34.2	56.9	3.7	.9
	Logan	915	.5	11.2	51.5	31.9	2.5	2.4
	Grundy	704	.5	14.7	62.6	21.7	.5	

TABLE 452.—*Percentage of eggs produced by chicken flocks of various sizes in selected counties, 1924*—Continued

MIDDLE WESTERN STATES—Continued

State	County	Eggs produced	Size of chicken flocks reported: 1 to 25 chickens	26 to 75 chickens	76 to 175 chickens	176 to 450 chickens	451 to 900 chickens	901 and over chickens
		1,000 dozens	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Missouri	Lawrence	1,408	1.3	19.5	54.1	22.7	2.4	-------
	Grundy	1,095	1.1	8.2	43.8	45.1	1.5	0.3
	Montgomery	1,490	.2	4.4	29.8	63.3	2.2	.1
Kansas	McPherson	1,804	.6	4.9	36.0	55.4	3.1	-------
	Franklin	1,295	.4	6.2	33.4	51.5	7.6	.9
Nebraska	Saline	1,091	.7	8.7	42.7	43.0	2.8	2.1
Iowa	Bremer	1,693	.2	3.8	28.6	63.0	4.4	-------
	Polk	1,482	1.5	12.8	44.3	37.3	3.3	.8
South Dakota	McCook	927	.4	5.8	31.1	59.7	2.8	.2
North Dakota	Richland	1,050	1.1	17.0	53.9	27.0	1.0	-------
Minnesota	Wright	1,546	1.4	24.2	52.6	20.9	.9	-------
	Hennepin	1,234	3.0	34.1	38.1	20.8	3.1	.9
	Freeborn	1,378	.4	8.0	47.9	40.7	3.0	-------
Wisconsin	Dane	2,407	.8	19.7	54.2	21.7	2.8	.8
	Milwaukee	466	5.8	47.9	32.3	10.2	3.8	-------
	Trempealeau	1,287	1.1	25.1	52.6	21.0	.2	-------
Michigan	Hillsdale	2,089	1.9	18.0	51.5	25.6	2.6	.4
	Tuscola	1,585	4.3	43.5	42.1	9.3	.8	-------
SOUTHERN STATES								
North Carolina	Forsythe	395	16.6	60.9	15.3	6.5	-------	0.7
Tennessee	Overton	313	8.7	62.7	27.3	1.3	-------	-------
	Greene	2,147	2.6	34.0	38.7	17.5	4.2	3.0
South Carolina	Lexington	538	21.6	54.7	13.2	5.3	3.8	1.4
	Orangeburg	436	32.4	45.8	16.9	3.0	.9	1.0
	Berkeley	131	57.2	31.3	7.0	4.5	-------	-------
Georgia	Sumter	133	29.6	41.8	12.3	6.8	8.6	.9
	Fulton	109	22.5	37.1	16.7	18.4	5.3	-------
Florida	Hillsborough	689	7.6	29.5	34.3	21.9	6.5	.2
	Marion	259	17.3	43.0	21.5	7.1	2.0	9.1
	Jackson	389	24.7	58.1	15.8	1.4	-------	-------
Alabama	Fayette	223	28.4	67.1	4.4	.1	-------	-------
	Pike	258	39.3	49.0	6.0	5.1	-------	.6
	Marshall	589	23.0	67.5	8.3	1.2	-------	-------
Louisiana	Lafayette	410	9.4	43.6	42.7	4.1	.2	-------
Oklahoma	Oklahoma	1,200	3.6	24.5	34.3	29.8	2.7	5.1
Texas	Dallas	1,231	6.5	41.9	27.2	14.5	6.8	3.1
	Fayette	1,694	1.4	19.6	50.8	27.7	.5	-------
Mississippi	Lee	347	18.4	64.4	14.4	2.0	.8	-------
	Noxubee	210	52.0	37.2	9.8	.5	.5	-------
	Jones	363	19.2	55.5	12.6	8.1	4.6	-------
Arkansas	Lonoke	404	18.3	55.6	20.0	5.0	1.1	-------
FAR WESTERN STATES								
Montana	Gallatin	283	3.4	33.5	38.1	22.4	2.6	-------
	Chouteau	399	3.9	41.1	45.1	9.9	-------	-------
Idaho	Canyon	1,538	4.0	25.9	34.4	27.4	7.0	1.3
Wyoming	Sheridan	294	4.7	37.4	42.0	15.5	.4	-------
	Converse	217	9.0	39.5	40.2	11.3	-------	-------
Colorado	Adams	611	2.7	27.4	36.0	26.2	5.3	2.4
	Otero	570	3.8	26.0	30.9	18.7	8.1	12.5
Utah	Salt Lake	1,398	4.1	16.1	11.3	15.7	18.4	34.4
Nevada	Douglas	101	.8	14.9	34.9	23.2	4.0	22.2
Arizona	Maricopa	1,795	3.5	17.6	20.5	25.4	15.3	17.7
New Mexico	Curry	499	1.7	22.2	48.4	26.4	.3	1.0
Washington	King	6,025	3.4	8.4	7.8	15.8	23.0	41.6
	Whatcom	4,437	3.5	7.6	8.2	25.6	35.1	20.0
	Walla Walla	489	7.2	31.8	30.7	19.6	6.7	4.0
Oregon	Clackamas	2,177	4.9	21.8	20.7	20.5	15.0	17.1
California	Sonoma	25,511	1.0	2.1	1.7	4.2	10.3	80.7
	Los Angeles	13,187	1.3	3.3	3.5	10.4	25.0	56.5

Bureau of Agricultural Economics; special tabulation of data collected by Census Bureau.

TABLE 453.—*Poultry, dressed: Receipts, gross weight, at four markets, 1920–1927*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
						BOSTON							
	1,000 lbs.	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
Av. 1921–1925	5, 130	3, 328	2, 526	1, 955	2, 394	2, 718	2, 480	2, 588	2, 692	4, 009	9, 092	10, 785	49, 696
1920	3, 934	1, 749	1, 597	1, 037	1, 464	2, 221	1, 858	1, 696	2, 096	2, 628	5, 911	7, 895	34, 086
1921	3, 377	2, 229	1, 465	1, 707	1, 795	2, 086	1, 499	2, 437	2, 482	3, 581	7, 472	9, 791	39, 921
1922	4, 175	2, 765	2, 478	1, 705	2, 551	2, 883	2, 091	2, 198	2, 479	3, 306	7, 488	10, 444	44, 563
1923	7, 690	3, 785	2, 917	1, 946	2, 439	2, 778	2, 427	2, 661	2, 674	4, 418	10, 752	11, 526	56, 013
1924	6, 210	4, 607	3, 072	2, 235	2, 602	2, 952	3, 492	2, 856	3, 270	4, 402	11, 842	13, 724	61, 264
1925	4, 200	3, 252	2, 697	2, 181	2, 582	2, 893	2, 893	2, 786	2, 554	4, 336	7, 907	8, 439	46, 720
1926	3, 778	2, 981	2, 837	2, 052	2, 598	3, 196	3, 161	3, 677	3, 960	4, 089	8, 891	11, 942	53, 162
1927	4, 318	3, 610	2, 440	2, 398	3, 653	3, 455	2, 996	3, 612	3, 404	4, 663	8, 511	10, 245	53, 305
						NEW YORK							
Av. 1921–1925	14, 791	9, 810	7, 559	6, 765	8, 000	8, 887	8, 737	9, 574	10, 887	14, 720	25, 594	29, 943	155, 266
1920	11, 217	7, 557	3, 928	1, 367	5, 480	5, 292	6, 129	4, 428	6, 273	8, 053	17, 651	23, 718	101, 093
1921	11, 441	7, 006	5, 190	5, 021	4, 883	6, 150	5, 314	8, 992	10, 277	11, 887	21, 182	27, 208	124, 551
1922	10, 783	6, 909	6, 371	6, 399	7, 896	8, 822	6, 785	7, 768	9, 115	12, 594	22, 232	32, 538	138, 212
1923	21, 730	12, 335	8, 390	6, 916	6, 804	8, 589	9, 414	9, 497	9, 653	16, 509	26, 822	27, 289	163, 948
1924	15, 603	11, 027	9, 893	7, 368	10, 172	10, 157	10, 502	10, 504	12, 981	15, 916	28, 875	35, 464	179, 362
1925	14, 400	10, 871	7, 949	8, 119	10, 245	10, 717	11, 668	11, 110	12, 409	16, 696	28, 857	27, 216	170, 257
1926	13, 078	10, 646	9, 921	8, 248	10, 594	14, 041	13, 555	14, 609	15, 068	18, 129	31, 924	33, 082	192, 895
1927	12, 954	8, 957	8, 722	7, 770	11, 633	13, 635	12, 168	14, 589	15, 470	17, 682	31, 740	32, 797	188, 117
						PHILADELPHIA							
Av. 1921–1925	2, 217	1, 648	1, 553	1, 071	1, 223	1, 495	1, 416	1, 545	1, 429	1, 784	3, 514	6, 257	25, 151
1920	1, 553	1, 881	1, 906	918	1, 466	1, 286	1, 019	1, 215	1, 044	1, 588	2, 348	5, 382	21, 606
1921	1, 498	1, 071	1, 411	1, 005	1, 303	1, 565	1, 226	1, 419	1, 587	2, 020	2, 882	5, 905	22, 892
1922	1, 947	1, 790	1, 077	664	1, 182	1, 304	1, 237	1, 217	1, 237	1, 356	2, 653	5, 655	21, 319
1923	2, 206	1, 530	1, 388	1, 042	1, 055	1, 509	1, 343	1, 618	1, 348	1, 749	3, 281	6, 542	24, 611
1924	2, 614	1, 818	1, 704	1, 194	1, 234	1, 458	1, 536	1, 660	1, 421	1, 873	4, 053	7, 075	27, 640
1925	2, 818	2, 030	2, 183	1, 450	1, 343	1, 638	1, 739	1, 810	1, 552	1, 924	4, 702	6, 106	29, 295
1926	2, 906	1, 791	2, 203	1, 717	1, 374	1, 758	1, 853	2, 039	2, 352	2, 123	4, 916	7, 094	32, 126
1927	2, 885	2, 006	2, 005	1, 769	1, 695	1, 668	1, 398	1, 918	2, 530	2, 613	4, 432	6, 903	31, 822
						CHICAGO							
Av. 1921–1925	8, 415	4, 570	3, 628	2, 668	2, 677	2, 997	2, 957	3, 033	3, 436	4, 568	15, 950	22, 997	77, 895
1920	6, 046	2, 687	980	816	1, 512	2, 369	2, 379	2, 659	3, 370	4, 001	10, 752	19, 153	57, 324
1921	6, 343	3, 328	2, 704	2, 104	2, 421	2, 524	2, 097	2, 615	3, 804	4, 157	15, 723	17, 082	64, 992
1922	5, 345	3, 042	3, 394	2, 744	2, 744	3, 597	3, 590	4, 250	4, 290	4, 178	13, 167	23, 320	73, 661
1923	11, 497	5, 208	4, 057	2, 532	2, 912	3, 329	3, 679	4, 018	4, 724	5, 411	15, 163	27, 743	90, 273
1924	12, 723	8, 043	5, 675	4, 385	3, 311	3, 295	4, 042	2, 523	2, 196	4, 791	15, 675	21, 805	88, 464
1925	6, 167	3, 230	2, 219	1, 573	1, 996	2, 239	1, 376	1, 760	2, 168	4, 303	20, 022	25, 033	72, 086
1926	6, 360	3, 159	2, 383	1, 792	1, 805	2, 105	2, 154	2, 607	2, 897	6, 397	22, 863	23, 110	77, 632
1927	6, 495	3, 516	2, 195	1, 835	2, 872	2, 257	1, 227	2, 257	2, 531	3, 752	15, 739	19, 029	63, 735
						TOTAL							
Av. 1921–1925	30, 553	19, 355	15, 265	12, 458	14, 294	16, 097	15, 590	16, 740	18, 444	25, 081	54, 150	69, 981	308, 009
1920	23, 350	13, 874	8, 411	4, 138	9, 922	11, 168	11, 385	9, 998	12, 783	16, 270	36, 662	56, 148	214, 109
1921	22, 659	13, 634	10, 860	9, 837	10, 402	12, 325	10, 136	15, 463	18, 150	21, 645	47, 259	59, 986	252, 356
1922	22, 250	14, 506	13, 320	11, 512	14, 373	16, 606	13, 703	15, 433	17, 121	21, 434	45, 540	71, 957	277, 755
1923	43, 123	22, 858	16, 752	12, 436	13, 210	16, 205	16, 863	17, 794	18, 399	28, 087	56, 018	73, 100	334, 845
1924	37, 150	26, 395	20, 344	15, 182	17, 319	17, 862	19, 572	17, 543	19, 868	26, 982	60, 445	78, 068	356, 730
1925	27, 585	19, 383	15, 048	13, 323	16, 166	17, 487	17, 676	17, 466	18, 683	27, 259	61, 488	66, 794	318, 358
1926	26, 122	18, 576	17, 344	13, 809	16, 371	21, 099	20, 724	22, 932	24, 278	30, 738	68, 594	75, 228	355, 815
1927	26, 652	18, 119	15, 362	13, 772	19, 853	21, 015	17, 789	22, 376	23, 935	28, 710	60, 422	68, 974	336, 979

Bureau of Agricultural Economics. Compiled from reports of bureau representatives in the various markets.

TABLE 454.—*Poultry, dressed: Receipts, gross weight, at four markets, by State of origin, 1922–1927*

BOSTON

State	1922	1923	1924	1925	1926	1927 Total	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Illinois	19,618	23,308	20,155	12,292	14,768	14,203	1,182	1,118	572	978	1,195	1,162	913	1,172	996	1,248	1,645	2,022
Indiana	5,939	6,558	7,382	6,524	4,884	5,225	569	541	412	231	443	427	221	304	286	401	640	750
Iowa	4,422	7,131	6,834	6,957	8,141	7,003	825	488	240	275	347	469	660	623	611	596	785	1,084
Ohio	1,708	1,141	1,216	255	300	533	48	5	10	22	18	1	26	(1)	41	108	162	92
Kansas	1,454	2,114	2,864	3,566	4,027	3,592	285	375	185	107	322	376	200	321	440	352	359	270
New York	1,454	1,850	1,111	1,045	1,251	1,467	57	24	98	151	124	93	114	10	31	57	379	329
Oklahoma	1,253	1,043	1,737	1,699	1,571	2,066	144	205	149	132	277	130	143	158	106	108	226	288
Minnesota	1,076	2,222	3,878	3,929	5,076	5,886	435	254	231	34	140	359	266	386	396	1,100	1,039	1,246
Michigan	1,015	527	911	622	524	681	34	(1)	47	26	9	32	36	51	23	102	230	91
Kentucky	1,005	1,330	854	822	970	453	3	4	8	2	31	(1)	29	32	-	3	202	139
Missouri	774	1,086	2,540	1,822	1,944	1,509	90	169	83	97	333	67	49	113	102	134	117	155
Wisconsin	680	291	612	375	1,236	553	135	63	84	23	28	15	-	-	-	-	65	140
Maine	647	791	706	709	438	690	27	16	11	3	6	13	20	69	85	137	168	135
Nebraska	471	682	1,336	1,707	2,297	1,930	222	139	100	108	102	186	147	279	131	180	92	244
Massachusetts	413	357	344	205	260	495	39	32	43	34	30	34	15	25	65	63	69	46
Vermont	200	149	105	74	34	26	1	(1)	1	1	1	2	1	1	3	2	4	9
Tennessee	65	39	73	118	234	160	-	-	24	20	20	-	-	-	-	-	52	44
New Hampshire	53	47	50	41	29	62	9	1	2	1	(1)	1	3	3	9	28	2	3
Pennsylvania	49	72	114	180	47	260	1	22	43	26	98	3	31	4	6	3	10	13
Maryland	39	59	92	11	24	2	1	-	-	-	-	-	-	-	-	-	-	1
North Dakota	14	294	314	237	553	469	31	34	20	5	20	-	-	-	-	-	22	337
South Dakota	3	121	101	92	131	46	1	1	(1)	-	-	-	-	-	-	16	-	28
Texas	(2)	(2)	6,185	2,797	3,703	5,110	115	28	33	75	43	41	78	38	24	-	2,172	2,463
Other States	2,189	4,681	1,750	467	555	812	64	62	44	47	66	44	44	23	49	25	71	273
Canada	22	120	-	174	165	72	(1)	29	-	-	-	-	-	-	-	-	-	43
Total	44,563	56,013	61,264	46,720	53,162	53,305	4,318	3,610	2,440	2,398	3,653	3,455	2,996	3,612	3,404	4,663	8,511	10,245

CHICAGO

State	1922	1923	1924	1925	1926	1927 Total	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Iowa	19,001	18,654	21,023	21,538	21,420	14,719	2,401	578	395	440	442	394	170	258	422	909	3,563	4,747
Illinois	18,720	17,497	13,184	4,517	5,920	3,893	467	176	84	56	87	62	49	158	331	255	909	1,259
Wisconsin	7,555	7,372	7,771	5,384	5,701	3,982	250	382	101	77	38	59	114	189	184	370	1,263	955
Minnesota	7,310	10,764	11,425	10,267	12,586	10,541	926	542	386	267	157	202	74	125	122	503	3,654	3,583
Missouri	3,952	6,231	5,980	4,621	3,828	4,812	346	164	115	245	268	289	228	445	527	398	920	867
South Dakota	3,348	4,509	6,396	5,954	7,388	6,069	702	467	233	86	256	348	244	212	183	264	1,478	1,596
North Dakota	3,292	7,594	5,984	5,714	6,041	4,769	484	355	113	20	11	20	8	13	17	108	1,546	2,074
Kansas	2,499	3,602	3,252	3,411	4,110	2,915	211	112	81	177	144	129	56	181	188	264	488	584

Nebraska	1,959	1,813	1,690	2,149	2,632	3,247	201	295	282	126	482	199	72	151	186	250	407	596
Indiana	1,347	818	849	731	411	536	86	31	11	3	32	63	36	66	58	39	35	76
Kentucky	849	937	508	80	107	208	7	54	5	1	52	27	(1)	1	23	5	29	4
Oklahoma	801	2,217	2,164	2,476	1,998	2,250	73	133	198	176	288	207	26	256	70	145	223	455
Texas	709	4,507	4,077	1,802	1,378	2,577	58	81	86	22	84	41	25	60	60	26	749	1,285
Tennessee	694	810	564	186	371	377	63	27	5	1	22	(1)	26	26	3	23	153	28
Michigan	332	276	186	82	40	66	7	2	7	2	3	21	3	4	(1)	(1)	11	6
Montana	271	1,300	2,095	1,738	1,773	1,022	170	75	20	9							129	619
Arkansas	256	372	315	117	177	238	12	20	26	15	19	21	4	8	5	70	14	24
New York	247	335	339	385	837	715	(1)	9	41	41	122	125	53	62	81	109	65	7
Mississippi	169	94	49	12	3	6	1		(1)	(1)	1	(1)	1	(1)	(1)	(1)	1	2
Idaho	69	40	75	131	26	120		(1)		28	34						26	32
Colorado	63	80	169	390	222	228	10	12	1	27	2	2	1	6		(1)	36	131
Wyoming	17	39	109	81	98	133	16	17	4	1							17	78
Other States	173	182	260	179	194	312	4	14	1	15	28	48	37	36	71	14	23	21
Canada	28	30		141	371													(1)
Total	73,661	90,273	88,464	72,086	77,632	63,735	6,495	3,546	2,195	1,835	2,872	2,257	1,227	2,257	2,531	3,752	15,739	19,029

NEW YORK

Illinois	40,911	48,267	57,246	45,861	32,890	28,356	1,780	1,473	2,318	2,141	2,734	2,687	2,486	2,180	1,405	1,718	3,441	3,993
Indiana	17,021	15,814	14,886	15,215	12,918	11,585	1,121	583	544	522	935	768	544	770	799	964	2,134	1,901
Iowa	15,854	19,520	18,775	18,776	29,840	25,226	2,023	1,276	905	463	805	1,179	1,097	1,256	1,932	3,697	5,564	5,029
Missouri	10,522	14,630	18,629	17,148	19,146	19,231	1,196	621	567	379	593	1,273	1,005	2,027	2,585	2,880	2,915	3,190
Kansas	10,174	15,151	8,429	11,379	20,757	20,725	2,119	1,805	1,052	741	1,033	1,385	1,455	1,982	2,173	2,144	2,535	2,301
Texas	5,296	7,206	12,108	6,665	10,059	13,192	361	416	332	292	422	315	201	260	268	127	4,776	5,422
Ohio	5,113	4,131	4,337	4,352	3,298	3,920	270	20	11	132	57	258	207	451	456	639	735	684
Minnesota	4,412	6,382	9,143	9,372	11,840	10,820	1,042	545	274	192	317	336	339	584	907	1,355	2,459	2,470
Tennessee	3,964	3,445	4,070	2,773	3,531	4,507	132	15	203	161	293	293	201	775	396	351	858	829
Kentucky	3,873	5,524	5,082	4,361	4,497	4,700	166	78	339	249	831	378	258	323	422	274	595	787
New York	3,572	3,062	3,119	11,459	12,966	16,438	194	191	545	913	1,836	2,997	3,024	2,221	2,025	1,355	1,036	101
Nebraska	2,515	3,036	4,610	4,288	6,979	7,041	667	515	405	477	616	388	220	236	594	724	973	1,226
Oklahoma	2,254	2,701	2,553	3,105	6,336	7,314	291	519	600	454	699	441	333	495	542	270	1,310	1,360
Virginia	1,904	1,956	2,588	1,899	2,299	2,229	95	20	9	8	35	169	169	311	235	282	516	380
Michigan	1,901	1,683	1,399	702	952	659	90	2	70	138	46	50	29	47		22	82	83
Wisconsin	1,503	2,364	2,862	3,058	2,787	1,843	138	109	2	24	47	233	108	247	190	150	380	215
New Jersey	1,395	1,552	1,661	1,303	1,298	1,022	193	138	51	33	89	36	29	27	35	38	90	263
Maryland	1,226	860	959	1,021	896	757	59	30	28	43	24	34	30	40	45	44	117	263
Pennsylvania	1,220	1,085	1,148	922	911	1,332	227	67	116	231	69	79	61	109	111	72	107	83
South Dakota	976	1,140	1,299	1,795	2,970	3,413	432	285	152	20	21	170	207	161	176	407	593	789
Massachusetts	848	632	1,408	1,146	461	425	(1)	13	53	89	47	45	34	25	18	27	31	43
California	649	1,061	528	459	605	318	13	14	46	18	25	16	68	24	29	8	13	44
North Dakota	165	769	515	668	1,056	1,028	142	31	53	1			23	3	32		245	498
Arkansas	129	326	(2)	760	788	78	24	20								15	1	18
Delaware	109	64	84	91	65	56	14	2	4	4	3	3	3	5	5	3	4	6
Colorado	(2)	(2)	530	434	600	315	28	15	6	2							49	215
Washington	(2)	238	173	205	673	248	37		(1)	39	29	95	6	22				20
Idaho	(2)	(2)	242	176	416	244	97										72	75

[1] Not over 500 pounds.

[2] Included in "Other States."

TABLE 454.—*Poultry, dressed: Receipts, gross weight, at four markets, by State of origin, 1922–1927*—Continued

NEW YORK—Continued

State	1922	1923	1924	1925	1926	1927												
						Total	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Montana	(2)	(2)	203	123	120	202	(1)	12	(1)							34	(1)	156
Other States	503	814	601	462	843	846	3	121	37	4	27	7	31	8	90	56	109	353
Canada	203	532	175	279	98	47		21								26		(1)
Total	138,212	163,948	179,362	170,257	192,895	188,117	12,954	8,957	8,722	7,770	11,633	13,635	12,168	14,589	15,470	17,682	31,740	32,797

PHILADELPHIA

State	1922	1923	1924	1925	1926	Total	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Illinois	7,165	9,497	9,456	8,728	5,505	4,232	676	589	357	699	132	195	65	213	98	293	431	484
Virginia	2,241	2,588	2,448	2,331	1,745	1,458	90	76	75	63	90	76	43	36	43	40	322	504
Indiana	1,907	1,762	1,231	1,750	3,659	4,135	351	221	365	182	285	329	190	483	474	464	416	375
Pennsylvania	1,372	1,260	919	901	805	824	126	47	58	54	28	60	78	93	147	64	39	30
Minnesota	1,274	2,389	2,252	2,732	3,796	4,475	346	100	84	41	133	83	163	240	537	479	830	1,439
Ohio	1,153	820	1,206	741	507	696	85	69	3	21	29	23	12	20	60	109	154	111
Missouri	1,088	522	1,002	2,315	2,035	1,168	47	106	90	68	134	92	62	96	127	153	65	128
Iowa	1,017	1,124	1,883	2,700	3,536	4,179	289	197	342	180	207	287	179	147	251	472	768	860
West Virginia	985	957	982	1,034	797	410	44	35	37	28	28	22	13				72	131
Kansas	660	655	932	910	885	1,615	142	31	113	24	116	82	149	106	168	192	270	222
New York	424	368	1,047	676	852	759	120	48	34	75	167		46		246		21	2
Wisconsin	396	406	268	697	787	544	140	6		22	2	19	20	8	13	92	82	140
Oklahoma	321	446	880	1,302	2,474	2,067	149	225	292	149	206	172	176	134	123	107	156	178
Delaware	262	138	77	77	47	10			(1)	1	1	1	1		(1)	(1)	3	3
Texas	213	130	798	303	1,208	1,829		62	92	72	40	114	53	58	54	17	458	809
Maryland	201	256	162	233	181	84	5	4	7	2	3	7	5	6	10	4	7	24
Nebraska	167	298	453	377	1,354	673	163	54	22	48	(1)	51	30	88	63	49	58	47
Michigan	142	36	39	256	36	102	23						23			17	17	22
Kentucky	81	68	459	171	105	504			10		25	24	69	68	116	59	74	59
New Jersey	63	71	227	15	107	113	(1)	25					21	67				
South Dakota	45	16	17	321	88	132	56	2	1								31	42
North Dakota	4	650	595	436	427	445	26	28	18	20							31	322
Other States	138	154	307	289	1,190	1,368	7	81	5	20	69	31		55	(1)	2	127	971
Total	21,319	24,611	27,640	29,295	32,126	31,822	2,885	2,006	2,005	1,769	1,695	1,668	1,398	1,918	2,530	2,613	4,432	6,903

Bureau of Agricultural Economics. Compiled from reports of bureau representatives in the various markets.

[1] Not over 500 pounds.

[2] Included in "Other States."

TABLE 455.—*Frozen poultry: Cold-storage holdings, United States, 1916–1927*

Year	Jan. 1	Feb. 1	Mar 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sept. 1	Oct. 1	Nov. 1	Dec. 1
	1,000 lbs.	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*	*1,000 lbs.*
Average:												
1916–1920	-------	-------	-------	-------	44, 660	35, 186	31, 613	28, 572	28, 451	30, 003	38, 313	50, 346
1921–1925	102, 063	108, 750	101, 045	82, 066	61, 570	47, 742	40, 930	36, 051	32, 730	33, 829	42, 881	70, 979
1916	-------	-------	-------	-------	17, 847	6, 559	6, 216	7, 032	8, 882	20, 041	31, 175	27, 139
1917	32, 184	35, 601	27, 796	25, 988	67, 242	64, 286	60, 194	54, 132	56, 093	46, 737	51, 743	49, 561
1918	64, 557	68, 238	56, 950	44, 115	26, 523	18, 929	17, 652	18, 756	23, 034	29, 798	44, 433	71, 238
1919	108, 722	119, 676	109, 627	92, 897	71, 162	55, 616	49, 212	40, 573	32, 918	30, 492	33, 139	54, 749
1920	87, 512	92, 253	78, 421	61, 436	40, 525	30, 535	24, 790	22, 364	21, 331	22, 953	31, 070	49, 046
1921	79, 025	81, 096	79, 001	62, 315	47, 651	35, 408	27, 268	21, 188	20, 064	25, 602	34, 876	65, 167
1922	103, 697	103, 350	88, 709	68, 471	50, 840	38, 602	34, 837	30, 659	27, 671	25, 984	30, 238	51, 781
1923	100, 170	121, 632	113, 503	94, 872	74, 562	57, 274	49, 100	41, 250	34, 131	33, 142	40, 363	63, 274
1924	93, 434	99, 486	93, 497	76, 067	52, 068	39, 299	34, 886	33, 604	33, 837	40, 070	55, 139	87, 939
1925	133, 990	138, 189	130, 513	108, 608	82, 732	68, 126	58, 562	53, 558	47, 946	44, 345	53, 787	86, 733
1926	111, 501	108, 512	95, 397	73, 124	52, 783	42, 808	36, 730	35, 793	38, 634	44, 771	64, 842	106, 854
1927	144, 497	145, 076	129, 510	104, 697	77, 282	61, 525	50, 064	42, 293	39, 711	43, 201	52, 315	85, 030

Bureau of Agricultural Economics. Compiled from reports from cold-storage establishments.

TABLE 456.—*Chickens: Estimated price per pound, received by producers, United States, 1910–1927*

Year beginning July-	July 15	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Apr. 15	May 15	June 15	Weighted av.
Average:	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1910–1913	11. 0	11. 8	11. 7	11. 6	10. 8	10. 6	10. 7	11. 0	11. 3	11. 6	11. 7	11. 8	11. 2
1914–1920	19. 4	18. 9	19. 0	18. 1	17. 2	16. 9	17. 4	18. 4	19. 0	19. 9	20. 0	20. 1	18. 1
1921–1925	20. 9	20. 2	19. 7	19. 1	18. 2	17. 9	18. 6	19. 3	19. 8	20. 6	21. 3	21. 4	19. 1
1910	12. 2	12. 0	11. 8	11. 4	11. 0	10. 6	10. 6	10. 6	10. 7	10. 9	11. 0	11. 1	11. 0
1911	11. 2	11. 2	11. 0	10. 6	10. 0	9. 7	10. 0	10. 4	10. 6	11. 0	11. 1	11. 0	10. 4
1912	11. 2	11. 3	11. 4	11. 4	11. 0	10. 8	10. 8	11. 0	11. 4	11. 7	11. 9	12. 0	11. 2
1913	13. 0	12. 8	12. 7	13. 0	11. 4	11. 3	11. 5	12. 0	12. 4	13. 0	12. 7	13. 1	12. 0
1914	13. 4	13. 1	12. 8	12. 0	11. 1	10. 7	10. 9	11. 3	11. 7	11. 9	12. 0	12. 2	11. 5
1915	12. 2	12. 2	12. 0	11. 8	11. 5	11. 2	11. 5	12. 1	12. 5	13. 1	13. 6	14. 0	12. 0
1916	14. 1	14. 1	14. 2	14. 4	13. 9	13. 6	14. 1	15. 1	15. 7	17. 3	17. 5	17. 7	14. 6
1917	17. 4	16. 7	18. 4	18. 5	17. 0	17. 5	18. 4	20. 3	20. 2	20. 7	20. 6	21. 3	18. 4
1918	23. 2	23. 4	23. 6	22. 2	21. 7	22. 4	22. 1	21. 8	23. 4	25. 7	26. 7	26. 4	23. 0
1919	26. 8	26. 1	25. 0	23. 3	22. 0	22. 0	23. 3	25. 7	26. 9	28. 4	28. 0	27. 4	24. 2
1920	28. 4	26. 6	26. 9	24. 6	22. 9	20. 6	21. 7	22. 3	22. 8	22. 2	21. 8	21. 5	22. 8
1921	21. 7	21. 4	20. 2	19. 1	18. 6	18. 2	18. 9	19. 0	19. 4	20. 0	20. 2	20. 6	19. 3
1922	20. 7	18. 9	18. 6	18. 1	17. 2	17. 2	17. 3	18. 6	18. 8	19. 4	20. 1	20. 3	18. 2
1923	20. 6	19. 8	19. 7	19. 0	17. 7	16. 6	17. 5	18. 2	18. 9	19. 4	20. 3	20. 5	18. 3
1924	20. 2	20. 0	19. 8	19. 4	18. 5	17. 9	18. 5	19. 1	20. 0	21. 1	22. 0	21. 6	19. 2
1925	21. 4	20. 8	20. 4	20. 0	19. 2	19. 5	20. 9	21. 5	21. 9	23. 1	23. 7	23. 9	20. 7
1926	23. 6	22. 1	21. 4	20. 8	20. 0	19. 8	20. 1	21. 1	21. 3	21. 8	21. 7	20. 2	20. 7
1927	19. 9	19. 7	19. 4	19. 7	19. 4	19. 2	-------	-------	-------	-------	-------	-------	-------

Bureau of Agricultural Economics. Based on returns from special price reporters.

TABLE 457.—*Turkeys: Estimated price per pound, received by producers, United States, 1912–1927*

Year beginning October—	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Year beginning October—	Oct. 15	Nov. 15	Dec. 15	Jan. 15
	Cents	*Cents*	*Cents*	*Cents*		*Cents*	*Cents*	*Cents*	*Cents*
1912	13. 6	14. 4	14. 8	14. 0	1920	30. 0	31. 8	33. 1	33. 0
1913	14. 6	15. 2	15. 5	15. 5	1921	25. 7	28. 2	32. 5	30. 7
1914	14. 1	14. 1	14. 5	14. 5	1922	25. 1	29. 5	32. 3	29. 7
1915	13. 7	14. 8	15. 5	15. 6	1923	26. 6	27. 9	24. 5	23. 1
1916	17. 0	18. 6	19. 6	19. 5	1924	23. 3	24. 2	25. 8	26. 2
1917	20. 0	21. 0	23. 0	22. 9	1925	24. 0	28. 3	31. 1	31. 7
1918	23. 9	25. 7	27. 0	27. 3	1926	26. 6	29. 8	32. 8	31. 6
1919	26. 6	28. 3	31. 1	32. 0	1927	26. 4	30. 8	32. 3	-------

Bureau of Agricultural Economics. Based on returns from special price reporters.

TABLE 458.—*Eggs: Receipts at five markets, 1917–1927*

BOSTON

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
	1,000 cases	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*
Av. 1921–1925	87	121	214	326	327	209	148	123	95	101	64	65	1,880
1917	56	75	171	252	318	193	113	87	84	80	43	30	1,502
1918	31	59	192	309	305	171	133	119	91	96	46	52	1,604
1919	67	116	184	327	235	189	148	128	80	97	48	40	1,659
1920	72	113	149	253	384	204	119	110	95	66	49	34	1,648
1921	84	138	206	359	294	183	137	130	100	88	52	52	1,823
1922	101	133	214	403	312	224	143	105	85	106	74	70	1,970
1923	99	106	244	285	381	219	128	131	101	108	73	69	1,944
1924	91	97	185	282	367	212	163	121	85	90	64	72	1,829
1925	61	129	222	303	282	206	169	126	102	112	58	63	1,833
1926	109	119	189	205	272	246	155	135	113	91	77	97	1,808
1927	120	153	245	307	270	234	155	128	109	92	65	82	1,960

NEW YORK

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Av. 1921–1925	332	461	898	1,062	948	778	569	478	414	353	235	271	6,799
1917	143	139	405	747	738	565	395	337	333	284	169	102	4,357
1918	106	155	712	908	681	551	483	450	333	288	183	177	5,027
1919	214	486	667	1,026	911	669	532	438	377	318	192	178	6,008
1920	207	315	618	563	697	725	470	370	334	272	209	211	4,991
1921	314	476	999	1,012	742	681	525	517	440	362	251	260	6,579
1922	335	424	919	1,178	994	784	574	427	381	337	226	242	6,821
1923	386	447	981	924	1,163	796	596	528	416	377	270	272	7,156
1924	301	410	717	1,082	970	789	590	429	405	361	221	259	6,543
1925	325	550	872	1,115	871	838	550	490	427	328	208	320	6,894
1926	393	471	813	860	868	871	579	502	433	344	284	400	6,818
1927	458	542	863	1,094	1,038	716	521	441	386	355	319	315	7,048

PHILADELPHIA

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Av. 1921–1925	88	112	177	258	246	168	127	123	120	91	63	74	1,648
1918	------	------	112	164	190	164	147	107	102	112	63	56	1,217
1919	64	100	174	301	271	185	129	115	107	119	76	63	1,704
1920	76	81	120	164	242	180	107	116	118	81	57	54	1,396
1921	64	120	202	237	235	158	121	145	124	100	66	70	1,642
1922	109	113	192	316	273	142	126	124	108	76	60	64	1,703
1923	104	111	179	187	278	196	131	128	141	110	74	88	1,727
1924	88	96	152	270	249	158	139	117	108	90	50	78	1,595
1925	77	121	161	279	196	188	117	99	121	79	65	69	1,572
1926	113	109	158	183	213	194	125	106	143	83	66	73	1,566
1927	96	100	183	244	211	158	119	114	117	80	68	59	1,549

CHICAGO

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Av. 1921–1925	164	327	571	803	836	654	395	307	224	153	77	93	4,605
1917	118	86	376	927	1,200	897	626	450	361	295	193	150	5,679
1918	108	29	415	1,027	926	733	564	460	338	240	124	86	5,050
1919	101	253	458	1,024	915	767	401	275	220	125	51	27	4,617
1920	109	251	458	840	800	620	380	260	217	132	47	40	4,154
1921	133	356	679	750	684	460	297	258	201	137	86	114	4,155
1922	210	296	525	887	898	695	389	300	191	140	82	71	4,684
1923	198	308	619	775	943	763	424	332	276	101	84	96	5,009
1924	176	347	519	823	879	637	458	318	228	156	76	62	4,679
1925	102	329	514	781	775	715	406	327	226	143	58	122	4,498
1926	236	319	507	763	836	626	449	283	197	132	103	124	4,575
1927	243	326	628	1,002	935	594	363	255	231	127	101	96	4,901

TABLE 458.—*Eggs: Receipts at five markets, 1917–1927*—Continued

SAN FRANCISCO

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
	1,000 cases	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*
Av. 1921–1925	58	59	96	98	88	81	70	60	51	48	44	49	801
1917	50	76	94	91	92	79	52	45	35	37	28	37	716
1918	53	81	80	93	83	71	51	39	34	27	26	29	667
1919	48	59	73	83	93	80	66	62	42	32	27	33	698
1920	44	55	102	114	80	76	67	55	42	43	36	43	757
1921	58	71	123	109	100	79	62	57	44	40	33	35	811
1922	54	59	102	118	106	81	72	63	51	45	42	45	838
1923	65	60	95	97	87	92	70	61	54	58	54	62	855
1924	58	56	81	82	79	75	72	57	50	51	46	53	760
1925	53	47	77	85	69	78	73	64	54	47	44	52	743
1926	55	52	74	75	72	77	78	56	47	49	51	58	744
1927	54	57	78	83	69	65	68	66	54	50	50	56	750

TOTAL

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Av. 1921–1925	729	1,080	1,956	2,548	2,445	1,890	1,308	1,091	904	746	483	552	15,733
1919	494	1,014	1,556	2,761	2,424	1,890	1,276	1,018	826	691	394	341	14,686
1920	508	815	1,447	1,934	2,203	1,805	1,143	911	806	594	398	382	12,946
1921	653	1,161	2,209	2,467	2,055	1,561	1,142	1,107	909	727	488	531	15,010
1922	809	1,025	1,952	2,902	2,583	1,926	1,304	1,019	816	704	484	492	16,016
1923	852	1,032	2,118	2,268	2,852	2,066	1,349	1,180	988	844	555	587	16,691
1924	714	1,006	1,654	2,539	2,544	1,871	1,431	1,042	876	748	457	524	15,406
1925	618	1,176	1,846	2,563	2,193	2,025	1,315	1,106	930	709	433	626	15,540
1926	906	1,070	1,741	2,086	2,261	2,015	1,386	1,081	933	699	581	752	15,511
1927	971	1,178	1,997	2,730	2,523	1,767	1,226	1,004	897	704	603	608	16,208

Bureau of Agricultural Economics. Compiled from reports of bureau representatives in the various markets.

TABLE 459.—*Eggs: Receipts at six markets, by State of origin, 1922–1927*

BOSTON

State	1922	1923	1924	1925	1926	1927 Total	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	1,000 cases	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*
Illinois	710	845	691	390	327	319	25	18	47	63	51	41	18	13	14	9	5	15
Indiana	320	233	185	156	163	211	7	11	31	46	34	28	16	11	9	7	5	6
Iowa	142	146	186	259	270	307	10	12	28	44	47	49	35	30	23	16	8	5
Minnesota	108	109	191	250	229	219	2	5	12	38	39	37	25	17	16	16	7	5
Ohio	105	87	75	39	52	115	4	5	15	20	15	14	11	11	6	6	4	4
Missouri	100	78	80	158	134	131	12	21	30	19	17	10	4	3	3	3	5	4
Maine	99	122	99	100	82	76	7	7	10	10	9	8	5	4	4	3	3	6
Kansas	83	61	57	174	152	206	26	25	22	10	17	14	18	16	18	16	14	10
Michigan	42	43	48	40	41	41	1	1	2	9	8	4	3	4	3	3	3	(1)
New York	40	36	37	28	31	41	5	13	3	1	3	2	1	3	2	3	(1)	5
New Hampshire	38	44	28	32	22	25	3	3	4	3	2	2	1	1	1	1	1	3
Vermont	37	36	25	27	18	17	2	1	2	3	2	2	1	1	1	1	(1)	1
Massachusetts	24	21	16	12	7	16	1	1	1	1	3	2	1	2	----	1	2	1
Nebraska	19	19	31	61	91	87	6	13	12	9	6	6	10	7	7	5	3	3
Other States	100	64	80	107	159	149	9	17	26	31	17	15	6	5	2	2	5	14
Total	1,970	1,944	1,829	1,533	1,808	1,960	120	153	245	307	270	234	155	128	109	92	65	82

CHICAGO

State	1922	1923	1924	1925	1926	1927 Total	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Missouri	1,045	880	661	604	655	832	40	40	141	198	163	96	41	28	27	19	20	19
Iowa	843	996	892	888	875	927	36	63	102	174	206	108	80	57	57	20	15	9
Kansas	532	501	433	349	403	477	50	55	72	108	62	32	25	21	12	13	8	19
Wisconsin	474	584	592	473	485	503	13	15	51	117	122	79	40	24	21	8	5	8
Minnesota	462	610	644	573	618	583	14	18	54	118	132	84	57	43	37	16	5	5
South Dakota	405	551	595	564	514	445	11	27	55	81	83	62	44	32	31	13	5	1
Nebraska	352	359	465	511	464	420	26	41	43	666	60	61	43	28	28	13	5	6
Illinois	310	256	194	170	148	152	5	7	14	49	41	17	8	4	3	1	1	2
Oklahoma	103	101	72	87	70	82	13	11	23	24	4	(1)	1	(1)	1	2	2	1
North Dakota	23	33	46	42	53	27	(1)	1	4	5	5	4	3	2	2	1	(1)	(1)
Texas	22	49	25	14	13	36	6	10	11	6	(1)	1	----	----	(1)	1	1	(1)
Michigan	18	18	20	14	13	37	3	2	3	4	7	7	4	2	2	1	1	1
Arkansas	14	20	3	15	23	48	6	8	17	12	4	(1)	(1)	(1)	(1)	1	(1)	(1)
Other States	81	51	37	104	193	275	17	22	28	30	38	36	12	11	8	17	32	24
Parcel Post	----	----	----	----	48	57	3	6	10	10	8	7	5	3	2	1	1	1
Total	4,684	5,009	4,679	4,495	4,575	4,901	243	326	628	1,002	935	594	363	255	231	127	101	96

NEW YORK

Illinois	1,379	1,342	1,223	1,258	939	950	55	60	148	147	159	112	61	56	36	32	39	45
Iowa	921	934	942	924	1,102	1,038	14	30	108	200	218	144	112	96	64	31	14	7
Indiana	726	575	526	568	542	566	23	29	73	121	110	70	52	31	22	16	10	9
Ohio	514	436	327	324	394	356	11	14	38	71	77	53	34	23	14	12	5	4
New York	491	645	615	658	637	605	38	39	65	84	89	79	52	41	34	32	21	31
Missouri	438	453	415	364	351	342	28	30	41	56	60	32	16	17	16	16	16	14
California	354	430	331	456	439	502	48	57	42	37	29	26	31	35	44	51	50	52
Pennsylvania	265	238	274	244	240	212	12	15	25	29	30	28	20	17	14	10	6	6
Tennessee	251	249	141	189	120	195	28	46	52	38	13	3	1	2	2	3	3	4
Kansas	222	242	151	197	237	214	13	23	32	30	25	19	12	16	17	9	10	8
Minnesota	217	264	261	246	201	178	7	2	13	29	37	22	17	16	16	12	5	2
Washington	143	271	254	375	543	655	86	72	46	37	37	30	36	31	44	74	80	82
Kentucky	143	103	61	74	69	97	7	15	27	25	12	6	2	2	(1)	(1)	(1)	1
New Jersey	134	199	222	216	213	194	16	19	25	23	29	18	15	11	12	11	7	8
Michigan	100	107	97	70	56	36	1	1	2	10	8	4	3	1	2	2	1	1
Maryland	84	124	124	118	118	141	7	12	21	24	21	17	12	8	6	4	4	5
Virginia	65	99	104	92	80	111	5	12	20	25	16	9	6	6	5	3	2	2
Wisconsin	54	54	65	90	78	54	1	2	6	14	12	6	5	2	2	(1)	3	1
Delaware	52	63	82	80	80	87	5	7	13	13	13	10	7	5	4	3	3	4
Nebraska	38	55	57	56	55	64	5	4	4	7	5	4	5	5	8	5	11	1
Other States	230	273	238	265	282	394	45	49	53	65	32	18	19	16	20	26	26	25
Parcel post					42	57	3	4	9	9	6	6	3	4	4	3	3	3
Total	6,821	7,156	6,543	6,594	6,818	7,048	458	542	863	1,094	1,038	716	521	441	356	355	319	315

PHILADELPHIA

Illinois	274	312	304	264	189	110	11	2	6	13	16	13	7	9	10	8	9	6
Missouri	152	147	134	131	260	221	37	14	32	23	20	17	18	17	21	11	5	6
Indiana	149	125	103	98	113	129	2	2	11	22	22	19	15	16	6	8	3	3
Ohio	149	100	103	129	100	96	1	1	4	22	23	17	9	11	5	3	(1)	(1)
Pennsylvania	147	174	155	133	109	97	5	12	14	15	15	8	5	4	3	4	3	9
Michigan	145	163	148	123	113	95	(1)	(1)	4	25	11	16	7	3	7	7	13	2
Virginia	144	149	153	120	99	129	5	14	29	29	25	7	7	3	2	3	3	2
Iowa	71	80	106	109	105	127	2	2	9	23	26	19	12	14	11	6	2	1
Maryland	68	66	58	55	38	35	3	5	9	4	4	2	2	1	2	1	1	1
Minnesota	63	75	84	113	104	151	3	5	4	14	10	21	25	22	29	13	4	1
Tennessee	61	25	12	27	15	59	5	10	28	11	1	1	(1)	(1)	(1)	(1)	1	2
Kansas	48	70	45	43	63	60	8	11	6	7	5	2	1	6	4	2	4	4
Delaware	46	53	46	35	23	16	2	3	4	2	2	1	1	(1)	(1)	(1)	(1)	1
Wisconsin	29	34	34	37	53	46	1	(1)	4	10	7	6	3	2	6	3	2	2
West Virginia	27	26	21	17	9	13		1	1	1	2	2	1	(1)	1	1	2	1
New York	17	35	26	29	19	6	1	(1)	(1)		(1)	(1)	(1)	1		1	1	2
Nebraska	15	36	15	17	46	30	5	9	2	2	5	2	2	1	1	1	(1)	(1)
Other States	98	57	48	92	103	129	5	9	16	21	17	5	4	4	9	8	15	16
Total	1,763	1,727	1,595	1,572	1,566	1,549	96	100	183	244	211	158	119	114	117	80	68	59

1 Not over 500 cases.

TABLE 459.—*Eggs: Receipts at six markets, by State of origin, 1922–1927*—Continued

SAN FRANCISCO

State	1922	1923	1924	1925	1926	1927 Total	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	1,000 cases	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*
California	824	825	737	686	710	705	52	56	77	81	67	59	56	58	51	49	47	52
Oregon	7	13	10	37	16	19	2	(1)	(1)	(1)	------	3	7	4	1	(1)	1	1
Washington	6	10	6	11	6	17	(1)	------	(1)	(1)	1	2	3	3	2	1	2	3
Idaho	1	6	3	6	10	6	(1)	------	1	1	1	1	1	1	(1)	(1)	(1)	(1)
Other States	------	1	4	3	2	3	------	1	(1)	1	------	(1)	1	(1)	(1)	(1)	(1)	(1)
Total	838	855	760	743	744	750	54	57	78	83	69	65	68	66	54	50	50	56

LOS ANGELES

State	1922	1923	1924	1925	1926	1927 Total	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
California	------	------	------	456	446	409	23	26	58	72	65	49	30	21	16	12	16	21
Idaho	------	------	------	62	56	22	1	(1)	1	4	4	5	4	2	1	(1)	(1)	(1)
Oregon	------	------	------	24	19	6	------	------	------	------	(1)	4	------	1	------	1	(1)	------
Utah	------	------	------	16	26	19	------	(1)	1	2	2	9	4	(1)	(1)	(1)	1	(1)
Other States	------	------	------	17	13	4	(1)	------	------	(1)	(1)	------	1	1	------	1	1	------
Total	------	------	------	575	560	460	24	26	60	78	71	67	39	25	17	14	18	21

Bureau of Agricultural Economics. Compiled from reports of bureau representatives in the various markets.

[1] Not over 500 cases.

Table 460.—*Case eggs:*[1] *Cold-storage holdings, United States, 1915–1927*

Year	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sept. 1	Oct. 1	Nov. 1	Dec. 1
	1,000 cases	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*	*1,000 cases*
Average:												
1916–1920	1, 202	256	23	248	2, 560	5, 251	6, 630	6, 849	6, 472	5, 645	4, 272	2, 466
1921–1925	1, 117	203	27	1, 030	4, 346	7, 475	9, 147	9, 513	9, 070	7, 790	5, 668	3, 315
1915	----	----	----	----	----	----	----	5, 029	5, 683	5, 019	3, 687	2, 788
1916	1, 508	458	35	264	2, 327	4, 593	5, 574	6, 060	5, 600	4, 868	3, 985	2, 146
1917	920	149	7	190	2, 105	4, 922	6, 617	6, 895	6, 436	5, 837	4, 638	2, 948
1918	1, 300	200	20	344	2, 957	5, 499	6, 554	6, 568	6, 265	5, 369	3, 812	2, 071
1919	740	130	26	320	3, 278	6, 098	7, 659	7, 850	7, 685	6, 858	5, 087	3, 341
1920	1, 542	342	29	122	2, 135	5, 143	6, 747	6, 872	6, 372	5, 295	3, 838	1, 824
1921	408	43	43	1, 926	4, 909	6, 844	7, 534	7, 605	7, 210	6, 269	4, 380	2, 403
1922	889	179	13	950	4, 648	8, 056	9, 811	10, 161	9, 608	7, 924	5, 726	3, 257
1923	1, 311	213	13	453	3, 737	7, 890	10, 222	10, 509	9, 883	8, 737	6, 645	4, 028
1924	1, 927	500	44	579	3, 563	6, 875	8, 685	9, 267	8, 778	7, 409	5, 267	3, 102
1925	1, 050	81	21	1, 240	4, 872	7, 712	9, 482	10, 024	9, 873	8, 612	6, 322	3, 786
1926	1, 683	578	77	872	3, 735	7, 236	9, 133	9, 845	9, 573	8, 048	5, 888	3, 215
1927	1, 096	253	92	1, 868	5, 501	8, 962	10, 565	10, 746	9, 650	7, 960	5, 485	2, 956

Bureau of Agricultural Economics. Compiled from reports from cold-storage establishments.

[1] 30-dozen cases.

Table 461.—*Eggs in the shell: International trade, average 1909–1913, annual 1924–1926*

Country	Year ended Dec. 31							
	Average 1909–1913		1924		1925		1926 preliminary	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
PRINCIPAL EXPORTING COUNTRIES	*1,000 dozen*	*1,000 dozen*	*1,000 dozen*	*1,000 dozen*	*1,000 dozen*	*1,000 dozen*	*1,000 dozen*	*1,000 dozen*
Austria	[1] 91, 561	[1] 177, 163	17, 203	----	16, 460	----	22, 315	1, 732
Irish Free State	----	----	628	42, 728	611	43, 592	440	43, 662
Denmark	2, 243	34, 340	1, 215	69, 374	473	67, 225	192	69, 351
Italy	4, 104	33, 482	4, 055	38, 356	6, 872	44, 612	10, 226	31, 535
Netherlands	19, 542	29, 360	7, 982	52, 426	8, 447	71, 063	9, 620	86, 414
China	270	25, 542	847	78, 688	----	65, 376	----	63, 230
Bulgaria	55	16, 512	3	13, 605	----	16, 219	----	17, 391
Poland	----	----	820	15, 317	1, 302	39, 787	82	86, 076
Rumania	18	12, 323	(2)	11, 757	(2)	15, 891	[3] 1	[3] 15, 824
United States	[4] 1, 701	12, 108	383	28, 117	609	24, 999	298	26, 634
Egypt	[4] 101	9, 690	14	17, 140	11	13, 174	1	8, 939
Hungary	----	----	16	8, 825	310	21, 010	234	24, 749
Lithuania	----	----	----	7, 060	----	5, 415	----	5, 787
Morocco	----	[5] 5, 653	----	15, 785	----	15, 654	----	15, 614
Argentina	2, 351	----	3, 003	4, 555	6, 321	3, 585	8, 477	1, 475
Estonia	----	----	13	943	(2)	1, 426	----	1, 036
Finland	2, 899	3	113	58	54	114	23	83
Union of South Africa	1, 382	[6] 90	71	19, 207	184	20, 732	62	20, 870
PRINCIPAL IMPORTING COUNTRIES								
Germany	228, 279	675	104, 471	705	203, 045	1, 547	196, 852	182
United Kingdom	190, 015	----	200, 079	628	216, 828	713	220, 741	500
France	37, 215	8, 920	9, 498	4, 494	7, 382	5, 168	9, 365	21, 821
Switzerland	19, 747	48	16, 874	12	17, 337	10	17, 198	10
Belgium	19, 148	11, 521	2, 689	13, 837	2, 901	17, 999	716	33, 796
Spain	7, 404	618	22, 706	3	19, 048	15	25, 318	20
Japan	6, 867	----	38, 157	----	28, 822	----	25, 462	----
Canada	6, 341	148	4, 981	2, 717	2, 722	2, 466	3, 560	1, 777
Cuba	4, 732	----	13, 019	----	11, 937	----	11, 774	----
Philippine Islands	4, 315	----	5, 108	----	5, 754	----	4, 942	----
Sweden	4, 207	3, 781	2, 861	1, 057	933	1, 153	1, 560	2, 619
Czechoslovakia	----	----	1, 779	10	1, 944	495	4, 032	1, 437
Norway	387	4	92	1, 092	127	1, 129	126	452
Total, 32 countries	654, 884	381, 981	458, 680	448, 496	560, 434	500, 569	573, 617	583, 098

Bureau of Agricultural Economics. Official sources.

[1] Average for Austria-Hungary.
[2] Less than 500 dozen.
[3] 9 months.
[4] 1 year only.
[5] 2-year average.
[6] 4-year average.

TABLE 463.—*Eggs, not in the shell: International trade, average 1909–1913 annual 1924–1926*

Country	Year ended Dec. 31							
	Average 1909–1913		1924		1925		1926, preliminary	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
PRINCIPAL EXPORTING COUNTRIES	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
China	....	17,217	....	94,712	....	133,895	....	132,471
PRINCIPAL IMPORTING COUNTRIES								
United Kingdom	(1)	(1)	48,461	653	53,599	913	65,235	613
United States	[2] 394	(3)	19,722	505	33,987	301	25,738	522
Germany	11,214	3,225	10,254	1,606	13,958	1,989	14,559	2,157
France	1,967	426	4,752	83	3,821	68	5,042	64
Netherlands	....	....	3,773	1,033	4,304	917	3,882	665
Italy	381	4	1,348	12	1,291	19	1,347	....
Canada	(3)	(3)	741	....	1,507	....	1,379	....
Irish Free State	....	....	1,006	88	1,091	19	1,022	22
Belgium	(1)	(1)	220	27	974	105	782	113
Sweden	[4] 255	(5)	560	7	804	2	758	20
Denmark	526	[6] 6	782	20	780	16	569	3
Total, 12 countries	14,737	20,878	91,619	98,746	116,116	138,244	120,313	136,650

Bureau of Agricultural Economics. Compiled from official sources.

[1] Not separately classified.
[2] 4-year average.
[3] States in value only.
[4] 2-year average.
[5] Less than 500 pounds.
[6] 3-year average.

TABLE 463.—*Eggs: Estimated price per dozen, received by producers, United States, 1910–1926*

Year beginning April	Apr. 15	May 15	June 15	July 15	Aug. 15	Sept. 15	Oct. 15	Nov. 15	Dec. 15	Jan. 15	Feb. 15	Mar. 15	Weighted av.
Average:	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1910–1913	16.7	16.6	16.5	16.5	17.7	20.4	23.9	28.1	30.0	27.5	23.1	19.2	19.0
1914–1920	26.0	27.0	26.2	27.3	29.5	33.6	38.2	43.9	49.0	45.5	34.8	27.4	30.1
1921–1925	21.1	21.3	21.7	23.3	25.8	30.2	36.9	46.4	48.4	38.0	31.9	22.7	25.9
1910	18.6	18.4	18.2	17.9	18.5	20.9	23.8	27.2	29.7	26.2	19.3	15.7	19.3
1911	14.8	14.6	14.4	14.8	16.4	18.7	21.8	26.1	29.1	29.3	26.8	21.2	18.2
1912	17.4	16.9	16.7	17.0	18.2	20.6	24.0	27.8	28.2	24.8	21.1	17.9	18.9
1913	15.9	16.5	16.8	16.4	17.7	21.3	26.0	31.3	32.9	29.8	25.3	22.2	19.8
1914	16.4	16.9	17.2	17.5	19.1	22.5	23.7	28.2	31.9	31.7	23.7	16.5	19.3
1915	16.6	16.5	16.1	16.3	17.3	20.6	24.6	29.4	31.1	28.8	24.2	18.2	19.0
1916	17.7	18.5	18.9	19.9	21.6	25.3	30.4	34.9	38.3	38.1	35.7	25.3	23.3
1917	28.5	30.2	29.9	29.0	30.5	35.8	38.5	41.2	45.9	48.9	45.8	30.9	33.0
1918	30.4	30.6	29.5	33.0	35.2	39.1	44.9	51.7	59.3	55.3	34.8	33.9	34.9
1919	36.0	38.9	36.1	37.9	40.6	43.1	51.0	59.1	69.6	60.9	48.5	40.5	41.8
1920	36.6	37.5	35.9	37.8	42.5	48.6	54.6	62.9	67.1	54.5	31.0	26.8	30.3
1921	20.5	19.4	20.1	24.3	28.9	30.9	39.4	50.0	51.1	31.7	31.4	19.5	25.3
1922	20.0	20.9	20.2	20.3	20.6	27.3	34.6	43.6	47.2	37.8	29.9	25.4	24.7
1923	21.6	21.8	20.9	21.3	23.6	29.8	34.6	45.6	45.5	35.4	33.6	20.4	25.2
1924	19.1	19.8	21.1	22.8	26.1	31.8	38.2	45.8	49.9	48.6	35.7	23.9	26.1
1925	24.2	24.8	26.1	27.9	30.0	31.1	37.7	46.8	48.1	36.3	28.9	24.1	28.3
1926	24.8	25.2	25.7	25.7	26.4	31.5	36.8	44.9	47.6	36.9	29.0	20.8	27.5
1927	20.3	19.8	17.8	20.7	23.4	29.4	35.6	41.6	43.3	......	......	......	....

Bureau of Agricultural Economics. Based on returns from special price reporters.

TABLE 464.—*Eggs: Average price per dozen at specified cities, 1910–1927*

FRESH FIRSTS AT NEW YORK

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
Average:	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
1914–1920	49	41	33	31	32	31	33	36	40	44	53	57	40
1921–1925	50	40	28	27	27	27	29	31	38	44	54	52	37
1910	38	27	23	22	21	20	18	21	24	26	31	34	25
1911	28	19	17	17	17	15	17	18	21	24	32	35	22
1912	34	36	22	20	19	19	20	21	24	26	31	29	25
1913	24	22	19	19	20	19	19	23	27	29	39	36	25
1914	33	29	26	20	20	21	21	24	26	27	35	38	27
1915	38	26	20	21	20	20	20	22	26	30	35	34	26
1916	31	26	22	22	22	23	25	29	33	34	41	46	30
1917	46	45	31	34	35	33	34	38	41	41	49	57	40
1918	65	58	38	35	35	36	41	43	47	53	65	67	49
1919	62	44	44	43	46	44	46	48	51	62	69	79	53
1920	71	59	48	44	44	43	47	51	57	64	77	78	57
1921	67	42	31	27	25	27	33	35	39	49	58	54	41
1922	41	38	25	26	27	25	24	26	39	43	53	53	35
1923	42	37	31	27	27	24	25	29	35	39	53	47	35
1924	42	39	25	24	25	27	29	33	39	44	52	57	36
1925	59	44	30	29	32	33	33	33	37	43	56	51	40
1926	38	31	29	32	31	30	29	31	38	40	50	48	36
1927	42	32	25	26	23	23	25	28	34	40	44	45	32

FRESH FIRSTS AT CHICAGO

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
Average:													
1914–1920	45	37	29	29	30	28	30	32	36	40	47	51	36
1921–1925	46	35	25	24	25	25	26	28	33	39	50	47	34
1910	34	26	21	20	19	18	16	18	22	24	28	30	23
1911	26	18	16	15	15	13	14	16	18	21	28	29	19
1912	33	32	21	19	18	17	18	19	22	24	26	25	23
1913	24	21	18	18	18	18	17	21	24	26	33	33	23
1914	32	27	22	18	19	18	19	21	22	23	28	32	23
1915	34	25	18	19	18	17	17	19	23	26	29	29	23
1916	29	24	19	20	21	21	22	24	28	31	36	39	26
1917	41	42	28	32	34	31	32	34	37	37	43	48	37
1918	58	51	35	33	82	32	37	38	43	50	61	62	44
1919	58	38	39	40	43	40	42	42	46	57	63	73	48
1920	65	52	45	41	41	39	42	47	53	57	68	71	52
1921	60	35	27	24	22	24	28	30	33	44	52	51	36
1922	37	32	23	23	24	22	21	22	29	35	48	48	30
1923	38	33	26	25	24	23	23	26	31	35	48	42	31
1924	41	35	22	22	24	25	26	30	36	41	48	52	34
1925	56	39	29	27	30	30	31	34	34	42	53	44	37
1926	36	29	27	29	29	28	27	29	36	40	48	44	34
1927	38	27	24	23	22	22	23	26	33	37	42	43	30
Boston, western firsts:													
1926	30	31	29	31	31	30	29	30	37	40	50	50	36
1927	41	31	26	25	24	23	25	28	34	39	44	44	32
Philadelphia, western extra firsts:													
1926	41	36	30	32	33	34	32	34	42	47	60	52	39
1927	43	33	27	26	26	25	28	33	40	48	55	50	36
San Francisco fresh extras:													
1926	38	28	26	28	28	31	33	38	44	50	49	44	36
1927	33	25	23	24	24	24	26	32	39	47	44	38	32

Bureau of Agricultural Economics. Prices 1910–1922 are averages of daily prices in New York Journal of Commerce, Price Current and Chicago Dairy Produce, Philadelphia Commercial List; average of weekly prices quoted in Boston Chamber of Commerce and Pacific Dairy Review. Beginning 1923, monthly prices from the Bureau of Labor Statistics, except San Francisco, which is from the Pacific Dairy Review. Earlier data for cities showing prices for 1926 and 1927 only are available in 1925 Yearbook, p. 1224, Table 636.

FOREIGN TRADE OF THE UNITED STATES IN AGRICULTURAL PRODUCTS

TABLE 465.—*Value of principal groups of farm and forest products exported from and imported into the United States, 1925–1927*

Article	Year ended June 30					
	Domestic exports			Imports		
	1925	1926	1927, preliminary	1925	1926	1927, preliminary
ANIMALS AND ANIMAL PRODUCTS	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*
Animals, live	7, 547	6, 975	5, 949	9, 885	12, 191	17, 620
Dairy products	25, 633	20, 766	17, 523	30, 531	31, 456	42, 100
Eggs and egg products	7, 337	8, 236	7, 901	6, 846	9, 369	7, 592
Hides and skins, raw (except fur)	11, 744	10, 629	11, 754	92, 678	94, 286	95, 056
Meats and meat products	273, 207	251, 038	203, 429	7, 159	11, 411	17, 636
Silk, unmanufactured	-----	-----	-----	361, 944	412, 913	421, 393
Wool and mohair, unmanufactured	133	118	146	124, 164	125, 494	83, 607
Animal products, miscellaneous	13, 479	14, 054	13, 925	39, 732	45, 347	38, 095
Total animals and animal products	339, 080	314, 816	260, 627	672, 939	742, 467	723, 168
VEGETABLE PRODUCTS						
Chocolate and cocoa	607	573	598	35, 720	42, 727	52, 332
Coffee	8, 285	9, 147	7, 863	267, 154	313, 225	293, 365
Cotton, unmanufactured:						
Long staple	-----	-----	-----	20, 409	23, 375	12, 461
Sea-island	179	342	411	-----	-----	-----
Other	210, 519	165, 925	129, 085	-----	-----	-----
Short staple	843, 056	747, 922	730, 583	30, 231	26, 835	24, 745
Linters	7, 226	3, 530	6, 845	-----	-----	-----
Total cotton, unmanufactured	1, 060, 980	917, 719	886, 924	50, 640	50, 210	37, 205
Fruits	85, 313	105, 115	128, 051	48, 383	55, 229	54, 141
Grains and grain products	536, 427	264, 204	406, 380	25, 198	35, 444	28, 480
Nuts	1, 100	1, 289	1, 667	35, 134	31, 408	33, 079
Oilseeds and oilseed products	47, 736	40, 377	40, 876	131, 800	148, 684	158, 166
Seeds, except oilseeds	3, 602	3, 419	3, 714	10, 290	13, 196	10, 351
Spices	236	207	220	18, 698	17, 278	18, 905
Sugar, molasses, and sirups	23, 616	22, 798	10, 367	203, 885	232, 206	266, 014
Tea	-----	-----	-----	28, 564	30, 874	30, 959
Tobacco, unmanufactured	131, 535	167, 251	136, 074	78, 657	60, 141	76, 669
Vegetables	17, 810	18, 986	20, 324	33, 676	39, 568	38, 700
Vegetable products, miscellaneous	24, 054	25, 838	24, 166	87, 840	105, 606	84, 609
Total vegetable products	1, 941, 301	1, 576, 923	1, 647, 224	1, 145, 639	1, 175, 799	1, 182, 982
Total farm products	2, 280, 381	1, 891, 739	1, 907, 851	1, 818, 578	1, 918, 266	1, 906, 150
FOREST PRODUCTS						
Dyeing and tanning materials	1, 937	1, 782	1, 939	7, 360	8, 150	8, 967
Gums, resins, and balsams	28, 511	33, 478	38, 282	29, 465	34, 170	31, 878
Rubber and similar gums	-----	-----	-----	238, 041	609, 947	374, 885
Wood	119, 676	120, 921	126, 949	103, 393	108, 040	103, 613
Forest products, miscellaneous	6, 063	6, 550	5, 773	87, 205	88, 185	93, 789
Total forest products	156, 187	162, 731	172, 943	465, 464	848, 492	613, 132
Total farm and forest products	2, 436, 568	2, 054, 470	2, 080, 794	2, 284, 042	2, 766, 758	2, 519, 282

Bureau of Agricultural Economics. Compiled from Monthly Summary of Foreign Commerce of the United States, June issues, 1926 and 1927.

TABLE 466.—*Exports of selected domestic agricultural products, averages 1900–1926 and annual 1909–1927*

Year ended June 30—	Butter	Cheese	Milk, condensed and evaporated	Eggs in the shell	Pork and its products, total [1]	Pork, fresh	Pork, pickled	Bacon, including Cumberland sides	Hams and shoulders, including Wiltshire sides	Lard
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 dozen*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Average:										
1900–1904	15, 425	31, 552	(²)	3, 125	1, 305, 217	28, 090	119, 050	361, 686	209, 954	576, 414
1905–1909	12, 484	11, 849	(²)	5, 439	1, 248, 682	13, 157	125, 799	271, 929	208, 230	622, 299
1910–1914	4, 278	4, 916	15, 774	13, 170	913, 025	2, 024	48, 275	182, 474	166, 813	474, 355
1915–1921	19, 519	37, 015	383, 512	26, 392	1, 678, 917	34, 669	42, 252	705, 741	326, 692	542, 567
1922–1926	7, 202	6, 676	191, 475	30, 783	1, 563, 645	32, 453	33, 553	320, 960	296, 941	853, 620
1909	5, 981	6, 823	(²)	5, 207	1, 053, 142	9, 555	52, 355	244, 579	212, 170	528, 723
1910	3, 141	2, 847	13, 311	5, 326	707, 110	1, 040	40, 032	152, 163	146, 885	362, 928
1911	4, 878	10, 367	12, 180	8, 559	879, 455	1, 355	45, 729	156, 675	157, 709	476, 108
1912	6, 092	6, 338	20, 643	15, 406	1, 071, 952	2, 598	56, 321	208, 574	204, 044	532, 256
1913	3, 586	2, 599	16, 526	20, 409	984, 697	2, 458	53, 749	200, 994	159, 545	519, 025
1914	3, 694	2, 428	16, 209	16, 149	921, 913	2, 668	45, 543	193, 964	165, 882	481, 458
1915	9, 851	55, 363	37, 236	20, 784	1, 106, 180	3, 908	45, 656	346, 718	203, 701	475, 532
1916	13, 487	44, 394	159, 578	26, 396	1, 462, 697	63, 006	63, 461	579, 809	282, 209	427, 011
1917	26, 835	66, 050	259, 141	24, 926	1, 501, 948	50, 436	46, 993	667, 152	266, 657	444, 770
1918	17, 736	44, 303	528, 759	18, 969	1, 692, 124	21, 390	33, 222	815, 204	419, 572	392, 506
1919	33, 740	18, 792	728, 741	28, 385	2, 704, 694	19, 644	31, 504	1, 238, 247	667, 240	724, 771
1920	27, 156	19, 378	708, 463	38, 327	1, 762, 611	27, 225	41, 643	803, 667	275, 456	587, 225
1921	7, 829	10, 826	202, 668	26, 960	1, 522, 162	57, 075	33, 286	489, 298	172, 012	746, 157
1922	7, 512	7, 471	277, 311	33, 762	1, 516, 320	25, 911	33, 510	350, 549	271, 642	812, 379
1923	9, 410	8, 446	157, 038	34, 284	1, 794, 880	43, 772	40, 934	408, 334	319, 269	952, 642
1924	5, 425	8, 038	213, 613	32, 832	1, 934, 189	49, 113	37, 469	423, 500	381, 564	1, 014, 898
1925	8, 384	9, 432	173, 547	25, 107	1, 400, 149	27, 603	26, 726	236, 263	202, 214	792, 735
1926	5, 280	4, 004	135, 865	27, 031	1, 172, 685	15, 867	29, 126	186, 153	220, 014	695, 445
1927, preliminary	5, 046	3, 773	108, 942	27, 962	1, 012, 689	10, 935	27, 962	127, 543	143, 649	675, 812

Year ended June 30—	Beef and its products, total [3]	Oleo oil	Cotton lint [4]	Linters [4]	Cottonseed oil, crude and refined	Cottonseed cake and meal	Linseed cake and meal	Prunes	Raisins	Apples, fresh	Oranges	Sugar, raw and refined [5]
	1,000 pounds	*1,000 pounds*	*1,000 bales*	*1,000 bales*	*1,000 gallons*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 barrels*	*1,000 boxes*	*1,000 sh. tons*
Average:												
1900–1904	636, 969	147, 626	6, 609	------	38, 792	1, 074, 720	552, 190	39, 767	3, 314	1, 109	(²)	6
1905–1909	509, 332	188, 550	8, 303	------	45, 863	1, 173, 349	684, 450	35, 003	6, 856	1, 239	(²)	16
1910–1914	221, 513	116, 225	8, 840	------	36, 192	933, 288	661, 819	80, 428	18, 004	1, 551	1, 186	35
1915–1921	434, 209	78, 154	6, 200	------	27, 923	706, 718	397, 783	60, 582	57, 477	1, 641	1, 635	510
1922–1926	188, 223	102, 130	6, 904	------	8, 203	567, 863	579, 815	129, 650	91, 513	2, 764	2, 096	412
1909	418, 844	179, 985	8, 896	------	51, 087	1, 233, 750	682, 765	22, 602	7, 880	896	867	40
1910	286, 206	126, 092	6, 413	------	29, 861	640, 089	652, 317	89, 015	8, 526	922	932	63
1911	265, 924	138, 697	8, 068	------	30, 069	804, 597	559, 675	51, 031	18, 600	1, 721	1, 179	28
1912	283, 925	126, 467	11, 070	------	53, 263	1, 203, 690	596, 115	74, 328	19, 949	1, 456	1, 197	40
1913	170, 208	92, 850	9, 125	------	42, 031	1, 128, 002	838, 120	117, 951	28, 121	2, 150	1, 063	22
1914	151, 212	97, 017	9, 523	------	25, 738	799, 974	662, 809	69, 814	14, 766	1, 507	1, 559	26
1915	394, 981	80, 482	8, 581	226	42, 449	1, 470, 065	524, 794	43, 479	24, 845	2, 352	1, 759	275
1916	457, 556	102, 646	5, 917	251	35, 535	1, 057, 222	640, 916	57, 423	75, 015	1, 466	1, 575	815
1917	423, 674	67, 110	5, 702	474	21, 188	1, 150, 160	536, 984	59, 645	51, 993	1, 740	1, 850	625
1918	600, 132	56, 603	4, 455	186	13, 437	44, 681	151, 400	32, 927	54, 938	635	1, 240	288
1919	591, 302	59, 202	5, 442	84	23, 823	311, 624	202, 788	59, 072	84, 150	1, 576	1, 402	558
1920	368, 002	74, 529	7, 035	52	21, 253	449, 573	336, 336	114, 066	86, 857	1, 051	1, 619	722
1921	203, 815	106, 415	5, 570	53	37, 769	454, 701	391, 264	57, 461	24, 492	2, 665	2, 001	292
1922	222, 462	117, 174	6, 592	126	12, 215	532, 721	484, 059	109, 398	40, 639	1, 094	1, 641	1, 001
1923	194, 912	104, 956	5, 205	48	8, 572	454, 350	574, 612	79, 229	93, 962	1, 756	1, 799	375
1924	185, 372	92, 965	5, 784	115	5, 256	250, 366	560, 114	136, 448	88, 152	4, 098	2, 592	135
1925	190, 211	105, 145	8, 239	200	7, 101	885, 375	691, 126	171, 771	90, 783	3, 201	2, 197	251
1926	148, 159	90, 410	8, 110	102	7, 869	716, 505	589, 166	151, 405	135, 027	3, 672	2, 253	300
1927, preliminary	152, 320	92, 719	11, 281	278	7, 677	990, 516	625, 121	175, 544	152, 337	7, 098	3, 340	114

Footnotes at end of table.

TABLE 466.—*Exports of selected domestic agricultural products, averages 1900–1926 and annual 1909–1927*—Continued

Year ended June 30—	Barley, including flour and malt [6]	Corn, including corn-meal	Oats, including oat-meal	Rice, including flour, meal, and broken rice	Rye, including flour	Wheat, including flour	Tobacco, unmanufactured [7]	Glucose and grape sugar	Hops	Starch
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 pounds*	*1,000 bushels*	*1,000 bushels*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Average:										
1900–1904	11,931	111,484	22,188	3,511	2,734	196,690	328,321	167,108	11,420	68,173
1905–1909	9,907	77,857	13,614	17,009	1,186	116,181	321,197	151,690	15,613	52,143
1910–1914	8,087	41,409	9,655	18,489	888	107,103	392,183	180,524	15,548	96,206
1915–1921	28,197	45,292	83,085	241,607	26,357	257,030	468,037	168,735	15,342	150,613
1922–1926	24,471	66,759	22,382	260,030	32,880	207,237	496,665	178,889	16,920	269,865
1909	6,729	37,665	2,334	1,567	1,296	116,373	287,901	112,225	10,447	33,228
1910	4,454	38,128	2,549	7,050	242	89,173	357,196	149,820	10,589	51,536
1911	9,507	65,615	3,846	15,575	40	71,338	355,327	181,963	13,105	158,239
1912	1,655	41,797	2,678	26,798	31	81,891	379,845	171,156	12,191	83,645
1913	17,874	50,780	36,455	24,801	1,855	145,159	418,797	200,149	17,591	110,898
1914	6,945	10,726	2,749	18,223	2,273	147,955	449,750	199,531	24,263	76,714
1915	28,712	50,668	100,609	75,449	13,027	335,702	348,346	158,463	16,210	107,037
1916	30,821	39,897	98,960	120,695	15,250	246,221	443,293	186,406	22,410	210,185
1917	20,319	66,753	95,106	181,372	13,703	205,962	411,599	214,973	4,825	146,424
1918	28,717	49,073	125,091	196,363	17,186	132,579	280,171	97,858	3,495	73,883
1919	26,997	23,019	109,005	193,128	36,467	287,402	629,288	136,230	7,467	143,788
1920	34,555	16,729	43,436	483,385	41,531	222,030	648,038	245,264	30,780	237,609
1921	27,255	70,906	9,391	440,855	47,337	369,313	506,526	141,954	22,206	135,365
1922	27,543	179,490	21,237	541,509	29,944	282,566	463,389	273,982	19,522	386,873
1923	21,909	96,596	25,413	370,670	51,663	224,900	454,364	162,693	13,497	260,796
1924	13,913	23,135	8,796	227,757	19,902	159,880	597,630	148,051	20,461	262,842
1925	28,543	9,791	16,777	112,037	50,242	260,803	430,702	139,577	16,122	214,247
1926	30,449	24,783	39,687	48,175	12,647	108,035	537,240	170,142	14,998	224,569
1927, preliminary	19,655	19,819	15,041	303,934	21,697	219,160	516,588	148,789	13,369	233,111

Year ended June 30—	Cornstarch [8]	Corn oil	Apples, dried	Apricots, dried	Apricots, canned [9]	Pears, canned [9]	Peaches, canned [9]	Pineapples, canned [9]
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
1913	----------	19,839	41,575	35,017	----------	----------	----------	----------
1914	----------	18,282	33,566	17,402	----------	----------	----------	----------
1915	----------	17,790	42,589	23,764	----------	----------	----------	----------
1916	----------	8,968	16,219	23,940	----------	----------	----------	----------
1917	----------	8,780	10,358	9,841	----------	----------	----------	----------
1918	38,659	1,831	2,603	5,230	----------	----------	----------	----------
1919	105,727	1,095	18,909	20,975	----------	----------	----------	----------
1920	163,315	12,483	11,819	26,768	----------	----------	----------	----------
1921	110,514	6,919	18,053	8,332	----------	----------	----------	----------
1922	348,940	5,280	12,431	16,736	----------	----------	----------	----------
1923	254,060	5,224	12,817	11,193	[10] 13,809	49,358	54,624	21,848
1924	255,135	4,196	30,323	38,777	26,576	38,431	50,374	25,238
1925	209,865	3,586	19,225	13,292	31,360	53,851	57,390	26,252
1926	208,463	2,927	24,833	18,132	29,547	75,876	83,160	37,543
1927	212,375	405	32,670	17,901	35,896	66,104	81,896	37,426

Bureau of Agricultural Economics. Compiled from Foreign Commerce and Navigation of the United States, 1900–1918, and Monthly Summary of Foreign Commerce of the United States, June issues 1921–1927.

Conversion factors used: Corn meal, 1 barrel=4 bushels corn; oatmeal, 18 pounds=1 bushel oats; rye flour, 1 barrel=6 bushels rye; malt, 1.1 bushels=1 bushel barley; wheat flour, 1 barrel=1900–1908, 4.75 bushels grain; 1909–1917, 4.7 bushels; 1918 and 1919, 4.5 bushels; 1920, 4.6 bushels; 1921–1927, 4.7 bushels; apples, 3 boxes=1 barrel; cottonseed oil, 7.5 pounds=1 gallon.

[1] Includes canned, fresh, salted, or pickled pork, lard, neutral lard, lard oil, bacon, and hams.
[2] Reported in value only.
[3] Includes canned, cured, and fresh beef, oleo oil, oleo stock, oleomargarine, tallow, and stearin from animal fats.
[4] Bales of 500 pounds gross; lint cotton and linters not separately reported prior to 1915.
[5] Includes maple sugar, 1919–1927.
[6] Includes barley flour 1919–1922. Barley flour not separately reported prior to 1919 nor in 1923–1927.
[7] Includes "Stems, trimmings, and scrap tobacco."
[8] Included with "Starch" prior to 1918.
[9] Given in value only prior to 1923.
[10] Jan. 1 to June 30.

TABLE 467.—*Imports of selected agricultural products, averages 1900–1926, annual 1909–1927*

Year ended June 30—	Butter	Cheese	Cattle hides	Goat-skins	Total hides and skins except furs	Silk [1]	Cotton, unman-ufac-tured	Wool, unman-ufac-tured	Total tobac-co, un-manu-fac-tured
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Average:									
1900–1904	192	17,846	131,736	83,047	309,360	13,942	67,292	155,394	28,216
1905–1909	532	30,462	138,922	95,555	372,292	20,061	78,771	209,413	38,688
1910–1914	2,480	49,220	253,430	95,822	530,909	28,671	110,957	207,584	55,790
1915–1921	9,445	20,213	332,076	85,358	573,359	42,895	177,606	394,663	66,695
1922–1926	13,684	55,865	228,236	78,251	436,741	64,866	175,609	329,968	68,470
1909	646	35,548	192,252	104,048	444,554	25,188	86,518	266,409	43,123
1910	1,360	40,818	318,004	115,845	608,619	23,457	86,038	263,928	46,853
1911	1,008	45,569	150,128	86,914	374,891	26,666	113,768	137,648	48,203
1912	1,026	46,542	251,012	95,341	537,768	26,585	109,780	193,401	54,740
1913	1,162	49,388	268,042	96,250	572,197	32,101	121,852	195,293	67,977
1914	7,842	63,784	279,963	84,759	561,071	34,546	123,347	247,649	61,175
1915	3,828	50,139	344,341	66,547	538,218	31,053	185,205	308,083	45,809
1916	713	30,088	434,178	100,657	743,670	41,925	232,801	534,828	48,078
1917	524	14,482	386,600	105,640	700,207	40,351	147,062	372,372	49,105
1918	1,806	9,839	267,500	66,933	432,517	43,681	103,326	379,130	86,991
1919	4,131	2,442	253,877	89,005	448,142	50,069	103,592	422,415	83,951
1920	20,771	17,914	439,461	126,996	798,569	58,410	345,314	427,578	94,005
1921	34,344	16,585	198,573	41,728	352,193	34,778	125,939	318,236	58,923
1922	9,551	34,271	204,936	83,535	392,904	57,437	179,165	255,087	65,225
1923	15,772	54,555	405,383	89,401	682,893	63,188	236,092	525,473	75,786
1924	29,466	66,597	176,475	65,881	365,194	56,595	146,024	239,122	54,497
1925	7,189	61,489	199,310	65,956	387,447	70,270	155,092	284,706	76,870
1926	6,440	62,412	155,587	86,484	355,266	76,838	161,454	345,512	69,974
1927, preliminary	10,710	89,782	156,935	83,571	368,884	85,162	190,963	271,129	92,957

Year ended June 30—	Coffee	Tea	Cocoa or cacao beans	Bana-nas	Olives	Al-monds in terms of shelled [2]	Pea-nuts in terms of shelled [2]	Wal-nuts in terms of shelled [2]	Coco-nut meat [3]
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 bunches*	*1,000 Gallons*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Average:									
1900–1904	928,799	94,342	54,936	(4)	(4)	7,862	(5)	[6]18,017	(5)
1905–1909	965,058	98,353	91,774	[6]36,988	[7]2,796	13,832	(5)	26,849	[7]15,010
1910–1914	899,339	95,108	141,800	43,684	4,388	16,039	22,615	28,497	45,128
1915–1921	1,227,534	105,675	319,103	37,157	4,335	19,857	49,659	19,748	252,370
1922–1926	1,337,950	96,089	376,247	48,924	[7]6,247	23,755	46,918	31,179	358,772
1909	1,049,869	114,917	129,855	36,974	2,969	11,029	(5)	26,158	23,843
1910	871,470	85,626	108,668	38,157	4,555	18,556	29,276	33,641	21,306
1911	875,367	102,564	138,058	44,699	3,045	15,523	18,834	33,619	37,817
1912	885,201	101,407	145,969	44,521	5,077	17,231	11,248	37,214	69,912
1913	863,131	94,813	140,039	42,357	3,946	13,856	14,989	17,213	40,870
1914	1,001,528	91,131	176,268	48,684	5,316	15,027	38,726	20,800	55,735
1915	1,118,691	96,988	192,307	41,092	3,622	13,679	19,338	20,490	96,485
1916	1,201,104	109,866	243,232	36,755	5,938	14,546	25,407	23,733	118,613
1917	1,310,871	103,364	338,654	34,661	5,642	19,916	32,385	23,839	256,801
1918	1,143,891	151,315	399,040	34,550	2,385	20,845	75,463	16,252	507,576
1919	1,046,029	108,172	313,037	35,382	3,501	25,615	20,425	9,057	315,749
1920	1,414,228	97,826	420,331	36,848	5,206	28,533	128,390	28,961	258,229
1921	1,348,926	72,196	327,123	40,808	4,054	15,861	46,202	15,902	213,134
1922	1,238,012	86,142	317,124	46,120	(4)	28,036	9,678	35,174	294,104
1923	1,305,188	96,660	381,508	44,504	(4)	24,345	45,013	25,970	338,507
1924	1,429,617	105,443	382,971	44,035	6,848	24,207	50,683	26,428	344,920
1925	1,279,570	92,779	382,570	50,513	5,901	22,503	93,191	36,623	371,961
1926	1,437,364	99,411	417,060	58,550	5,992	19,686	36,026	31,698	444,278
1927, preliminary	1,444,624	97,402	425,406	57,102	5,212	15,890	49,792	31,776	507,136

Footnotes at end of table.

TABLE 467.—*Imports of selected agricultural products, averages 1900–1926, annual 1909–1927*—Continued

Year ended June 30—	Coconut oil	Olive oil, edible and inedible	Chinese wood oil or Chinese nut oil	Flaxseed	Linseed oil	Sugar, raw and refined	Molasses	Jute and jute butts, unmanufactured	Manila or abaca	Sisal and henequen
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 bushels*	*1,000 gals.*	*1,000 short tons*	*1,000 gallons*	*1,000 long tons*	*1,000 long tons*	*1,000 long tons*
Average:										
1900–1904	(8)	9,746	(8)	504	(9)	1,894	13,788	102	54	87
1905–1909	[7] 44,486	32,541	(9)	218	(9)	1,961	20,221	114	58	98
1910–1914	54,145	41,736	39,242	7,258	368	2,194	33,859	93	72	140
1915–1921	179,674	45,472	45,920	14,156	1,183	2,981	113,669	86	70	171
1922–1926	215,049	113,967	81,084	18,198	7,563	4,225	179,021	72	75	108
1909	52,491	33,746	(9)	594	(9)	2,095	22,093	157	62	91
1910	48,346	34,089	(9)	5,002	(9)	2,047	31,292	68	93	100
1911	51,118	37,382	(9)	10,499	(9)	1,969	23,838	65	74	118
1912	46,371	41,044	35,757	6,842	737	2,052	28,828	101	69	114
1913	50,504	43,803	44,975	5,294	174	2,370	33,927	125	74	154
1914	74,386	52,361	36,993	8,653	192	2,533	51,410	106	50	216
1915	63,135	55,230	37,052	10,666	535	2,710	70,840	83	51	186
1916	66,008	60,820	37,262	14,679	50	2,817	85,717	108	79	229
1917	79,223	61,381	51,481	12,394	111	2,666	110,238	113	77	143
1918	259,195	19,889	36,118	13,367	51	2,452	130,731	78	86	150
1919	344,728	32,983	46,625	8,427	990	2,918	130,075	53	68	153
1920	271,510	52,716	79,602	23,392	4,550	3,798	154,670	77	77	176
1921	173,889	35,288	33,300	16,170	1,997	3,506	113,414	90	52	159
1922	230,236	83,337	55,572	13,632	22,494	4,232	87,908	62	44	72
1923	212,573	117,262	89,392	25,006	7,568	4,367	161,135	85	98	98
1924	181,230	113,409	80,898	19,577	2,379	3,765	174,037	84	98	97
1925	250,121	118,071	94,695	13,419	3,145	4,339	215,778	56	73	146
1926	[10] 200,878	137,757	84,861	19,354	2,231	4,420	256,246	71	62	126
1927 preliminary	286,776	134,729	102,628	24,224	177	4,320	260,259	80	61	116

Year ended June 30—	Milk and cream, fresh [11]	Cream, fresh	Eggs, Whole, in the shell	Eggs and egg yolks, dried, frozen, or prepared	Whole eggs, dried [12]	Whole eggs, frozen [12]	Yolks, dried [12]	Yolks, frozen [12]	Egg albumen, dried [13]	Egg albumen, frozen, prepared and preserved [12]	Hair of the Angora (mohair) [13]
	1,000 gallons	*1,000 gallons*	*1,000 dozen*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
1913	------	1,247	1,367	228	------	------	------	------	------	------	------
1914	------	1,773	6,015	3,420	------	------	------	------	------	------	------
1915	------	2,077	3,047	8,572	------	------	------	------	------	------	------
1916	------	1,191	733	6,022	------	------	------	------	------	------	------
1917	------	744	1,110	10,318	------	------	------	------	------	------	------
1918	------	712	1,619	14,598	------	------	------	------	------	------	------
1919	2,592	(14)	848	9,085	------	------	------	------	------	------	------
1920	3,989	(14)	1,348	24,091	------	------	------	------	------	------	------
1921	4,391	(14)	3,316	28,768	------	------	------	------	------	------	------
1922	4,536	(14)	1,224	16,540	------	------	------	------	7,388	------	------
1923	5,148	(14)	535	14,821	------	------	------	------	3,213	------	[15] 7,220
1924	6,623	[10] 1,646	426	[17] 14,830	[16] 544	[16] 1,106	[16] 522	[16] 1,210	6,642	[16] 636	3,583
1925	6,418	4,765	682	--------	1,884	8,751	4,281	4,151	3,257	1,106	2,404
1926	7,479	4,798	276	--------	1,365	12,647	6,004	5,662	4,490	5,119	6,463
1927	6,106	5,273	296	--------	1,132	8,114	4,468	4,601	3,859	3,967	6,547

Bureau of Agricultural Economics. Compiled from Commerce and Navigation of the United States. 1900–1918, and Monthly Summary of Foreign Commerce, June issue, 1919–1927.

[1] Includes "Silk, raw or as reeled from cocoon," "Silk waste," and "Silk cocoons."

[2] Conversion factors used: Almonds, 30 per cent unshelled equals shelled. Peanuts, 3 pounds unshelled equals 2 pounds shelled. Walnuts, 42 per cent unshelled equals shelled.

[3] Includes broken, copra, shredded, desiccated or prepared.

[4] Reported in value only.

[5] Included with "All other nuts."

[6] Two-year average.

[7] Three-year average.

[8] Included with "All other, fixed or expressed" vegetable oils.

[9] Included with "All other, fixed or expressed" vegetable oils, 1905–1906, and "Nut oil, or oil of nuts." 1907–1911.

[10] Does not include "dutiable" coconut oil.

[11] Not separately classified prior to 1919.

[12] Not separately classified prior to January, 1924.

[13] Not separately classified prior to 1922.

[14] Not separately classified.

[15] Beginn ng Sept. 22, 1922.

[16] ng Jan. 1, 1924.

[17] July 1-Dec. 31, 1923.

TABLE 468.—*Exports and imports of selected forest products, 1909–1927*

Year ended June 30—	Domestic exports					Imports					
	Lumber		Rosin	Spirits of turpentine	Timber, hewn and sawed	Camphor, crude	Rubber and similar gums, crude, total	Lumber		Shellac	Wood pulp
	Boards, deals, and planks	Staves						Boards, deals, planks, and other sawed	Shingles		
	1,000 M feet	*Thousands*	*1,000 barrels*	*1,000 gallons*	*1,000 M feet*	*1,000 pounds*	*1,000 pounds*	*1,000 M feet*	*1,000 M*	*1,000 pounds*	*1,000 L. tons*
1909	1,358	52,583	2,170	17,502	419	1,990	114,599	846	1,058	19,185	274
1910	1,684	40,784	2,144	15,538	491	3,007	154,621	1,054	763	29,402	378
1911	2,032	65,726	2,190	14,818	532	3,726	145,744	872	643	15,495	492
1912	2,307	64,163	2,474	19,599	438	2,155	175,966	905	515	18,746	478
1913	2,550	89,006	2,806	21,094	512	3,709	170,747	1,091	560	21,912	502
1914	2,405	77,151	2,418	18,901	441	3,477	161,777	929	895	16,720	508
1915	1,129	30,297	1,372	9,464	174	3,729	196,122	939	1,487	24,153	538
1916	1,177	57,538	1,571	9,310	201	4,574	304,183	1,218	1,769	25,818	507
1917	1,042	61,409	1,639	8,842	184	6,885	364,914	1,175	1,924	32,540	699
1918	1,068	63,207	1,071	5,095	106	3,638	414,984	1,283	1,878	22,913	504
1919	1,073	62,753	882	8,065	92	2,623	422,215	977	1,757	14,269	475
1920	1,518	80,791	1,322	7,461	234	4,026	660,610	1,492	2,152	34,151	727
1921	1,269	65,710	877	9,742	123	2,093	371,300	920	1,831	23,872	624
1922	1,543	35,162	786	10,786	268	1,592	578,512	1,124	2,190	30,768	902
1923	1,549	57,466	1,040	9,012	383	3,498	810,028	1,958	2,695	32,773	1,293
1924	1,867	60,868	1,205	11,194	815	1,955	633,489	1,786	2,417	28,512	1,188
1925	1,929	79,922	1,412	12,308	586	1,904	824,434	1,732	2,551	21,436	1,529
1926	1,985	75,534	1,073	10,254	652	2,616	952,659	1,869	2,482	26,188	1,469
1927, preliminary	2,013	74,824	1,229	13,820	707	2,175	903,272	1,828	2,275	28,707	1,509

Bureau of Agricultural Economics. Compiled from Foreign Commerce and Navigation of the United States, 1909–1918, and Monthly Summary of Foreign Commerce of the United States, June issues, 1920–1927.

TABLE 469.—*Value of trade between the United States and noncontiguous Territories, 1922–1927*

Year ended June 30—	Porto Rico		Hawaii		Alaska	
	Shipments to	Shipments from	Shipments to	Shipments from	Shipments to	Shipments from
	1,000 dollars	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*
1922	21,926	53,892	12,734	66,292	7,123	13
1923	24,080	61,801	15,976	93,313	8,297	190
1924	28,819	66,581	17,530	104,267	9,016	365
1925	29,710	70,190	17,954	97,430	9,774	415
1926	32,212	70,385	17,806	105,470	9,539	516
1927	32,603	84,060	18,025	98,576	8,735	592

Bureau of Agricultural Economics. Compiled from Monthly Summary of Foreign Commerce of the United States, June issues, 1923–1927.

In the statistics of foreign commerce of the United States, the Philippine Islands are treated as a foreign country.

The statistics of foreign commerce include the trade of the customs districts of Alaska, Hawaii, and Porto Rico with foreign countries but do not include the trade of these Territories with the United States.

TABLE 470.—*Destination of principal farm products exported from the United States, 1924–1927*

Article and country to which exported	Year ended June 30—							
	1924	1925	1926	1927	1924	1925	1926	1927
ANIMALS AND ANIMAL PRODUCTS								
Cattle:	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Total	33	106	36	21	100.0	100.0	100.0	100.0
Mexico	26	99	30	16	78.8	93.4	83.3	76.2
Cuba	3	3	3	3	9.1	2.8	8.3	14.3
Belgium	2	1	0	0	6.1	.9	.0	.0
Other countries	2	3	3	2	6.0	2.9	8.4	9.5
Butter:	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*				
Total	5,425	8,384	5,280	5,046	100.0	100.0	100.0	100.0
Mexico	843	1,109	1,015	859	15.5	13.2	19.2	17.0
Cuba	805	870	782	734	14.8	10.4	14.8	14.5
Haiti	512	565	585	498	9.4	6.7	11.1	9.9
Other West Indies [1]	733	805	479	550	13.5	9.6	9.1	10.9
Panama	739	806	719	582	13.6	9.6	13.6	11.5
Peru	518	455	424	356	9.5	5.4	8.0	7.1
Other South America	210	325	384	603	3.9	3.9	7.3	12.0
Philippine Islands	250	181	230	187	4.6	2.2	4.4	3.7
United Kingdom	(2)	2,354	0	0	(3)	28.1	.0	.0
Other countries	815	914	662	677	15.2	10.9	12.5	13.4
Cheese:								
Total	3,938	9,432	4,094	3,773	100.0	100.0	100.0	100.0
Cuba	1,123	1,063	910	832	28.5	11.3	22.2	22.1
Other West Indies [1]	510	566	600	479	13.0	6.0	14.7	12.7
Mexico	824	983	940	670	20.9	10.4	23.0	17.8
Panama	339	408	403	434	8.6	4.3	9.8	11.5
Central America	281	276	278	284	7.1	2.9	6.8	7.5
Canada	265	1,334	216	350	6.7	14.1	5.3	9.3
China	115	144	233	252	2.9	1.5	5.7	6.7
Germany	35	3,601	13	0	.9	38.2	.3	.0
Other countries	446	1,057	501	472	11.4	11.3	12.2	12.4
Milk:								
Condensed—								
Total	67,112	49,297	42,656	35,799	100.0	100.0	100.0	100.0
Total Europe	4,014	973	479	424	6.0	2.0	1.1	1.2
Cuba	32,266	21,226	16,337	12,843	48.1	43.1	38.3	35.9
Japan, including Chosen	7,540	5,873	4,744	4,029	11.2	11.9	11.1	11.3
Philippine Islands	8,046	6,961	7,767	6,471	12.0	14.1	18.2	18.1
China	2,769	2,668	3,811	3,621	4.1	5.4	8.9	10.1
Hongkong	2,470	2,409	1,992	2,065	3.7	4.9	4.7	5.8
Mexico	1,600	1,404	1,285	1,308	2.4	2.8	3.0	3.7
Other countries	8,407	7,783	6,241	5,038	12.5	15.8	14.7	13.9
Evaporated—								
Total	146,501	124,250	93,210	73,143	100.0	100.0	100.0	100.0
Total Europe	109,407	85,891	52,147	30,527	74.7	69.1	55.9	41.7
Germany	49,403	43,355	19,306	1,851	33.7	34.9	20.7	2.5
United Kingdom	36,528	28,662	29,181	27,418	24.9	23.1	31.3	37.5
France	7,889	3,765	1,011	410	5.4	3.0	1.1	.6
Netherlands	7,461	7,328	1,743	202	5.1	5.9	1.9	.3
Other Europe	8,126	2,781	906	646	5.6	2.2	.9	.8
Philippine Islands	8,162	10,067	12,902	12,806	5.6	8.1	13.8	17.5
Peru	4,165	5,013	3,737	4,215	2.8	4.0	4.0	5.8
Panama	3,660	3,742	3,597	4,127	2.5	3.0	3.9	5.6
Mexico	2,627	2,589	3,293	2,714	1.8	2.1	3.5	3.7
China	908	2,608	3,227	3,025	.6	2.1	3.5	4.1
Other countries	17,572	14,340	14,307	15,729	12.0	11.6	15.4	21.6
Powdered—								
Total	2,706	5,623	3,270	3,007	100.0	100.0	100.0	100.0
Total Europe	986	4,059	1,124	504	36.4	72.2	34.4	16.8
United Kingdom	304	702	191	131	11.2	12.5	5.8	4.4
France	303	276	165	149	11.2	4.9	5.0	5.0
Germany	243	1,036	205	56	9.0	18.4	6.3	1.9

[1] Excludes Bermuda. [2] Less than 500. [3] Less than 0.05 per cent.

TABLE 470.—*Destination of principal farm products exported from the United States, 1924–1927*—Continued

Article and country to which exported	Year ended June 30—							
	1924	1925	1926	1927	1924	1925	1926	1927
ANIMALS AND ANIMAL PRODUCTS—con.								
Milk—Continued.	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Powdered—Continued.								
Other Europe	136	2,045	563	168	5.0	36.4	17.3	5.5
Japan	913	414	468	338	33.7	7.4	14.3	11.2
Cuba	151	237	162	214	5.6	4.2	5.0	7.1
Canada	110	130	112	85	4.1	2.3	3.4	2.8
Panama	101	128	199	227	3.7	2.3	6.1	7.5
Mexico	76	140	143	304	2.8	2.5	4.4	10.1
Peru	59	86	129	168	2.2	1.5	3.9	5.6
China	57	87	432	408	2.1	1.5	13.2	13.6
Venezuela	41	55	105	170	1.5	1.0	3.2	5.7
Other countries	212	287	396	589	7.9	5.1	12.1	19.6
	1,000 dozen	*1,000 dozen*	*1,000 dozen*	*1,000 dozen*				
Eggs, in the shell:								
Total	32,832	25,107	27,931	27,962	100.0	100.0	100.0	100.0
Total Europe	3,391	777	1,419	304	10.3	3.1	5.1	1.1
United Europe	3,377	777	1,418	303	10.3	3.1	5.1	1.1
Other Europe	14	(2)	1	1	(3)	(3)	(3)	(3)
Cuba	13,135	11,958	12,235	11,903	40.0	47.6	43.8	42.6
Mexico	6,544	4,719	4,039	3,899	19.9	18.8	14.5	13.9
Canada	6,480	2,681	3,425	3,162	19.7	10.7	12.3	11.3
Argentina	1,882	3,568	4,960	6,763	5.7	14.2	17.8	24.2
Other countries	1,400	1,404	1,853	1,931	4.4	5.6	6.5	6.9
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*				
Beef, canned:								
Total	1,545	1,835	2,350	2,996	100.0	100.0	100.0	100.0
Total Europe	774	753	1,472	1,729	50.1	41.0	62.6	57.7
Germany	388	29	9	2	25.1	1.6	.4	.1
United Kingdom	304	692	1,419	1,680	19.7	37.7	60.4	56.1
Netherlands	72	0	1	(2)	4.7	.0	(3)	(3)
Other Europe	10	32	43	47	.6	1.7	1.8	1.5
Philippine Islands	113	213	105	99	7.3	11.6	4.5	3.3
Cuba	35	163	155	334	2.3	8.9	6.6	11.1
Other West Indies [1]	101	125	217	118	6.5	6.8	9.2	3.8
Mexico	78	95	100	80	5.0	5.2	4.3	2.7
Honduras	58	42	36	26	3.8	2.3	1.5	.9
Newfoundland and Labrador	52	67	45	77	3.4	3.7	1.9	2.6
Panama	38	34	42	25	2.5	1.9	1.8	.8
Canada	32	142	50	47	2.1	7.7	2.1	1.6
Other countries	264	201	128	461	17.0	10.9	5.5	15.5
Beef, pickled and other cured:								
Total	21,851	22,407	19,279	18,834	100.0	100.0	100.0	100.0
Total Europe	3,985	4,192	3,130	2,788	18.2	18.7	16.2	14.8
United Kingdom	1,667	1,944	952	801	7.6	8.7	4.9	4.3
Norway	1,106	1,264	1,120	977	5.1	5.6	5.8	5.2
Other Europe	1,212	984	1,058	1,010	5.5	4.4	5.5	5.3
Newfoundland and Labrador	7,420	7,841	6,501	6,689	34.0	35.0	33.7	35.5
West Indies [1]	4,828	5,011	4,684	4,999	22.1	22.4	24.3	26.5
British West Africa	1,277	868	927	881	5.8	3.9	4.8	4.7
Dutch Guiana	856	1,109	1,062	987	3.9	4.9	5.5	5.2
Other South America	1,467	1,925	1,536	734	6.7	8.6	8.0	3.9
Other countries	2,018	1,461	1,439	1,756	9.3	6.5	7.5	9.4
Bacon:								
Total	408,099	211,706	165,229	118,314	100.0	100.0	100.0	100.0
Total Europe	368,915	177,909	136,397	89,656	90.4	84.0	82.6	75.8
United Kingdom	146,233	104,626	86,557	59,353	35.8	49.4	52.4	50.2
Germany	80,226	25,972	14,043	6,818	19.7	12.3	8.5	5.8
Italy	38,399	7,357	3,264	1,439	9.4	3.5	2.0	1.2
Netherlands	37,059	7,995	6,379	2,480	9.1	3.8	3.9	2.1
Norway	10,427	8,775	7,050	2,422	2.6	4.1	4.3	2.0
Other Europe	56,571	23,184	19,104	17,144	13.8	10.9	11.5	14.5
Cuba	26,049	27,330	22,085	21,007	6.4	12.9	13.4	17.8
Other countries	13,135	6,467	6,747	7,651	3.2	3.1	4.0	6.4

[1] Excludes Bermuda. [2] Less than 500. [3] Less than 0.05 per cent.

TABLE 470.—*Destination of principal farm products exported from the United States, 1924–1927*—Continued

Article and country to which exported	Year ended June 30— 1924	1925	1926	1927	1924	1925	1926	1927
ANIMALS AND ANIMAL PRODUCTS—con.								
Cumberland sides:	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Total	[4] 15, 401	24, 557	20, 924	9, 229	100. 0	100. 0	100. 0	100. 0
Total Europe	[4] 15, 069	24, 323	20, 420	8, 905	97. 8	99. 0	97. 6	96. 5
United Kingdom	[4] 14, 796	23, 979	20, 352	8, 866	96. 1	97. 6	97. 3	96. 1
Other Europe	[4] 273	344	68	39	1. 7	1. 4	. 3	. 4
Other countries	[4] 332	234	504	324	2. 2	1. 0	2. 4	3. 5
Hams and shoulders, cured:								
Total	369, 459	277, 567	208, 446	142, 742	100. 0	100. 0	100. 0	100. 0
Total Europe	332, 847	248, 900	187, 035	125, 441	90. 1	89. 7	89. 8	87. 9
United Kingdom	297, 752	229, 125	180, 611	123, 565	80. 6	82. 5	86. 6	86. 6
Belgium	21, 159	13, 400	3, 929	451	5. 7	4. 8	1. 9	. 3
Other Europe	13, 936	6, 375	2, 495	1, 425	3 8	2. 4	1. 3	1. 0
Cuba	14, 248	15, 725	10, 553	6, 548	3. 9	5. 7	5. 1	4. 6
Other countries	22, 364	12, 942	10, 858	10, 753	6 0	4. 6	5. 1	7. 5
Wiltshire sides:								
Total	[4] 12, 105	14, 647	11, 569	907	100. 0	100. 0	100. 0	100. 0
Total Europe	[4] 10, 415	12, 025	9, 557	826	86 0	82. 1	82. 6	91. 1
United Kingdom	[4] 10, 019	12, 025	9, 525	826	82. 8	82. 1	82. 3	91. 1
Other Europe	[4] 396	0	32	0	3. 2	. 0	. 3	. 0
Canada	[4] 1, 667	2, 573	2, 011	79	13. 8	17. 6	17. 4	8. 7
Other countries	[4] 23	49	1	2	. 2	. 3	(3)	. 2
Pork:								
Canned—								
Total	2, 691	4, 185	5, 947	6, 731	100. 0	100. 0	100. 0	100. 0
Total Europe	2, 399	4, 018	5, 242	5, 675	89. 1	96. 0	88. 1	84. 3
United Kingdom	2, 220	4, 003	5, 196	5, 595	82. 5	95. 7	87. 4	83. 1
Other Europe	179	15	46	80	6. 6	. 3	. 7	1. 2
Other countries	292	167	705	1, 056	10. 9	4. 0	11. 9	15. 7
Fresh—								
Total	49, 113	27, 603	15, 868	10, 935	100. 0	100. 0	100. 0	100. 0
Total Europe	37, 004	22, 033	11, 660	7, 410	75. 3	79. 8	73. 5	67. 8
United Kingdom	27, 742	19, 016	10, 686	7, 128	56. 5	68. 9	67. 3	65. 2
Other Europe	9, 262	3, 017	974	282	18. 8	10. 9	6. 2	2. 6
Canada	8, 828	1, 755	1, 194	622	18. 0	6. 4	7. 5	5. 7
Cuba	2, 181	2, 045	2, 138	1, 763	4. 4	7. 4	13. 5	16. 1
Other countries	1, 100	1, 770	876	1, 140	2. 3	6. 4	5. 5	10. 4
Pickled—								
Total	37, 469	26, 726	29, 126	27, 962	100. 0	100. 0	100. 0	100. 0
Canada	8, 437	5, 392	7, 889	5, 800	22. 5	20. 2	27. 1	20. 7
Newfoundland and Labrador	5, 155	4, 206	3, 580	3, 532	13. 8	15. 7	12. 3	12. 6
Cuba	4, 412	3, 909	5, 935	7, 760	11. 8	14. 6	20. 4	27. 8
United Kingdom	4, 106	3, 281	2, 972	3, 857	11. 0	12. 3	10. 2	13. 8
Germany	3, 309	492	476	134	8. 8	1. 8	1. 6	. 5
British West Indies	3, 084	2, 672	2, 457	2, 730	8. 2	10. 0	8. 4	9. 8
Norway	2, 349	1, 814	1, 469	394	6. 3	6. 8	5. 0	1. 4
Haiti	1, 305	1, 014	972	917	3. 5	3. 8	3. 3	3. 3
Other countries	5, 312	3, 946	3, 376	2, 838	14. 1	14. 8	11. 7	10. 1
Lard:								
Total	1,014,898	792, 735	695, 445	675, 812	100. 0	100. 0	100. 0	100. 0
Total Europe	824, 418	623, 875	518, 691	489, 376	81. 2	78. 7	74. 6	72. 4
Germany	329, 793	251, 983	208, 541	174, 621	32. 5	31. 8	30. 0	25. 8
United Kingdom	240, 017	223, 011	218, 146	222, 086	23. 6	28. 1	31. 4	32. 9
Italy	77, 210	41, 145	13, 891	7, 642	7. 6	5. 2	2. 0	1. 1
Netherlands	71, 570	50, 309	41, 479	46, 071	7. 1	6. 4	6. 0	6. 8
Belgium	40, 634	22, 538	14, 092	12, 718	4. 0	2. 8	2. 0	1. 9
Other Europe	65, 194	34, 820	22, 542	26, 238	6. 4	4. 4	3. 2	3. 9
Cuba	92, 083	86, 480	77, 377	79, 599	9. 1	10. 9	11. 1	11. 8
Other countries	98, 397	82, 380	99, 377	106, 837	9. 7	10. 4	14. 3	15. 8

[3] Less than 0.05 per cent.

[4] Six months—January-June.

TABLE 470.—*Destination of principal farm products exported from the United States, 1924–1927*—Continued

Article and country to which exported	Year ended June 30—							
	1924	1925	1926	1927	1924	1925	1926	1927
ANIMALS AND ANIMAL PRODUCTS—con.								
Lard compounds, containing animal fats:	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Total	6,907	8,922	14,958	10,548	100.0	100.0	100.0	100.0
Haiti	1,498	1,528	1,458	564	21.7	17.1	9.7	5.3
Mexico	1,307	1,252	1,020	542	18.9	14.0	6.8	5.1
Cuba	930	2,750	7,691	3,649	13.5	30.8	51.4	34.6
Central America	701	598	815	492	10.1	6.7	5.4	4.7
British West Indies	500	294	264	327	7.2	3.3	1.8	3.1
South America	381	274	1,226	665	5.5	3.1	8.2	6.3
Virgin Islands	283	253	276	233	4.1	2.8	1.8	2.2
United Kingdom	265	657	423	1,868	3.8	7.4	2.8	17.7
Other countries	1,042	1,316	1,785	2,208	15.2	14.8	12.1	21.0
Lard, neutral:								
Total	24,239	20,421	20,132	20,057	100.0	100.0	100.0	100.0
Total Europe	22,021	18,670	18,641	18,283	90.8	91.4	92.6	91.2
Netherlands	8,028	6,141	4,645	5,260	33.1	30.1	23.1	26.2
United Kingdom	4,609	2,702	4,039	3,530	19.0	13.2	20.1	17.6
Norway	3,293	1,891	1,315	1,039	13.6	9.3	6.5	5.2
Germany	2,412	4,706	5,519	5,895	10.0	23.0	27.4	29.4
Sweden	1,402	1,227	904	912	5.8	6.0	4.5	4.5
Denmark	1,285	1,027	1,001	726	5.3	5.0	5.0	3.6
Other Europe	992	976	1,218	921	4.0	4.8	6.0	4.7
Other countries	2,218	1,751	1,491	1,774	9.2	8.6	7.4	8.8
Oleo oil:								
Total	92,965	105,145	90,410	92,719	100.0	100.0	100.0	100.0
Total Europe	89,707	102,135	87,177	88,128	96.5	97.1	96.4	95.0
Netherlands	41,650	46,207	26,271	27,270	44.8	43.9	29.1	29.4
United Kingdom	12,177	12,453	17,611	18,691	13.1	11.8	19.5	20.2
Norway	12,143	8,918	5,541	5,460	13.1	8.5	6.1	5.9
Germany	11,218	18,869	24,005	25,443	12.1	17.9	26.6	27.4
Greece	4,762	6,661	5,735	3,972	5.1	6.3	6.3	4.3
Other Europe	7,757	9,027	8,014	7,292	8.3	8.7	8.8	7.8
Other countries	3,258	3,010	3,233	4,591	3.5	2.9	3.6	5.0
VEGETABLE PRODUCTS								
Cotton, excluding linters:	*1,000 bales* [5]	*1,000 bales* [5]	*1,000 bales* [5]	*1,000 bales* [5]				
Total	5,784	8,239	8,110	11,281	100.0	100.0	100.0	100.0
Total Europe	5,020	7,141	6,624	8,813	86.8	86.7	81.7	78.1
United Kingdom	1,683	2,605	2,278	2,623	29.1	31.6	28.1	23.3
Germany	1,272	1,766	1,657	2,820	22.0	21.4	20.4	25.1
France	739	933	927	1,063	12.8	11.3	11.4	9.4
Italy	560	748	743	841	9.7	9.1	9.2	7.5
Other Europe	766	1,089	1,019	1,457	13.2	13.3	12.6	12.8
Japan	584	850	1,118	1,644	10.1	10.3	13.8	14.6
Other countries	180	248	368	824	3.1	3.0	4.5	7.3
Linters:								
Total	115	200	102	278	100.0	100.0	100.0	100.0
Total Europe	109	191	88	258	94.8	95.5	86.3	92.8
Germany	74	126	33	154	64.3	63.0	32.4	55.4
France	13	19	16	26	11.3	9.5	15.7	9.4
United Kingdom	10	18	19	51	8.7	9.0	18.6	18.3
Belgium	7	9	4	12	6.1	4.5	3.9	4.3
Other Europe	5	19	16	15	4.4	9.5	15.7	5.4
Canada	5	9	14	20	4.3	4.5	13.7	7.2
Other countries	1	(2)	(2)	(2)	.9	(3)	(3)	(3)

[2] Less than 500. [3] Less than 0.05 per cent. [5] Bales of 500 pounds.

TABLE 470.—*Destination of principal farm products exported from the United States, 1924–1927*—Continued

Article and country to which exported	Year ended June 30—							
	1924	1925	1926	1927	1924	1925	1926	1927
VEGETABLE PRODUCTS—continued								
Fruits:								
Dried—	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Apples— Total	30, 410	19, 225	24, 833	32, 670	100. 0	100. 0	100. 0	100. 0
Total Europe	29, 662	18, 552	23, 840	31, 313	97. 5	96. 5	96. 0	95. 8
Germany	12, 212	6, 632	8, 864	12, 158	40. 2	34. 5	35. 7	37. 2
Netherlands	9, 384	4, 714	7, 871	9, 568	30. 9	24. 5	31. 7	29. 3
Sweden	2, 595	2, 169	1, 975	2, 278	8. 5	11. 3	8. 0	7. 0
United Kingdom	2, 171	2, 577	1, 902	2, 282	7. 1	13. 4	7. 7	7. 0
Denmark	1, 586	911	1, 053	1, 371	5. 2	4. 7	4. 2	4. 2
Other Europe	1, 714	1, 549	2, 175	3, 656	5. 6	8. 1	8. 7	11. 1
Other countries	748	673	993	1, 357	2. 5	3. 5	4. 0	4. 2
Apricots— Total	38, 777	13, 292	18, 132	17, 901	100. 0	100. 0	100. 0	100. 0
Total Europe	35, 582	10, 699	16, 221	15, 776	91. 8	80. 5	89. 5	88. 1
Netherlands	9, 897	1, 426	4, 063	3, 316	25. 5	10. 7	22. 4	18. 5
Germany	9, 252	3, 082	3, 946	4, 593	23. 9	23. 2	21. 8	25. 7
United Kingdom	6, 419	1, 994	2, 654	2, 084	16. 6	15. 0	14. 6	11. 6
Denmark	3, 594	836	1, 707	1, 962	9. 3	6. 3	9. 4	11. 0
Sweden	1, 671	749	776	952	4. 3	5. 6	4. 3	5. 3
France	648	1, 018	931	409	1. 7	7. 7	5. 1	2. 3
Other Europe	4, 101	1, 594	2, 144	2, 460	10. 5	12. 0	11. 9	13. 7
Canada	2, 153	1, 664	1, 132	1, 257	5. 6	12. 5	6. 2	7. 0
Other countries	1, 042	929	779	868	2. 6	7. 0	4. 3	4. 9
Prunes— Total	136, 448	171, 771	151, 405	175, 544	100. 0	100. 0	100. 0	100. 0
Total Europe	115, 110	150, 541	125, 278	145, 710	84. 4	87. 6	82. 7	83. 0
Germany	51, 126	55, 000	18, 893	38, 553	37. 5	32. 0	12. 5	22. 0
United Kingdom	30, 161	31, 633	37, 096	40, 173	22. 1	18. 4	24. 5	22. 9
Netherlands	12, 015	15, 565	8, 943	10, 242	8. 8	9. 1	5. 9	5. 8
Sweden	7, 047	5, 465	4, 871	6, 854	5. 2	3. 2	3. 2	3. 9
France	3, 694	20, 240	39, 146	27, 217	2. 7	11. 8	25. 9	15. 5
Other Europe	11, 067	22, 638	16, 329	22, 671	8. 1	13. 1	10. 7	12. 9
Canada	15, 209	14, 776	17, 723	20, 454	11. 1	8. 6	11. 7	11. 7
Other countries	6, 129	6, 454	8, 404	9, 380	4. 5	3. 8	5. 6	5. 3
Raisins— Total	88, 152	90, 783	135, 027	152, 337	100. 0	100. 0	100. 0	100. 0
Total Europe	32, 552	39, 287	83, 706	97, 714	36. 9	43. 3	62. 0	64. 1
United Kingdom	20, 607	23, 675	43, 185	49, 991	23. 4	26. 1	32. 0	32. 8
Denmark	4, 706	3, 802	2, 107	1, 994	5. 3	4. 2	1. 6	1. 3
Netherlands	4, 107	4, 266	13, 802	13, 857	4. 7	4. 7	10. 2	9. 1
Germany	528	5, 100	18, 738	16, 039	. 6	5. 6	13. 9	10. 5
Other Europe	2, 604	2, 444	5, 874	15, 833	2. 9	2. 7	4. 3	10. 4
Canada	34, 093	38, 040	32, 914	37, 400	38. 7	41. 9	24. 4	24. 6
Japan	7, 695	1, 919	2, 513	2, 801	8. 7	2. 1	1. 9	1. 8
China	4, 963	3, 485	4, 406	3, 549	5. 6	3. 8	3. 3	2. 3
Other countries	8, 849	8, 052	11, 488	10, 873	10. 1	8. 9	8. 4	7. 2
Fresh—	*1,000 barrels*	*1,000 barrels*	*1,000 barrels*	*1,000 barrels*				
Apples— Total	2, 032	1, 505	1, 851	4, 483	100. 0	100. 0	100. 0	100. 0
Total Europe	1, 921	1, 384	1, 678	4, 154	94. 5	92. 0	90. 7	92. 7
United Kingdom	1, 735	1, 255	1, 477	3, 305	85. 4	83. 4	79. 8	73. 7
Other Europe	186	129	201	849	9. 1	8. 6	10. 9	19. 0
Other countries	111	121	173	329	5. 5	8. 0	9. 3	7. 3

TABLE 470.—*Destination of principal farm products exported from the United States, 1924–1927*—Continued

Article and country to which exported	Year ended June 30—							
	1924	1925	1926	1927	1924	1925	1926	1927
VEGETABLE PRODUCTS—continued								
Fruits—Continued.								
Fresh—Continued.	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Apples— Total	6,198	5,088	5,464	7,844	100.0	100.0	100.0	100.0
Total Europe	4,881	3,973	3,993	6,142	78.8	78.1	73.1	78.3
United Kingdom	3,662	3,354	2,717	3,723	59.1	65.9	49.7	47.5
Germany	477	291	577	1,237	7.7	5.7	10.6	15.8
Other Europe	742	328	699	1,182	12.0	6.5	12.8	15.0
Canada	646	443	631	730	10.4	8.7	11.5	9.3
Other countries	671	672	840	972	10.8	13.2	15.4	12.4
Oranges— Total	2,592	2,197	2,241	3,340	100.0	100.0	100.0	100.0
Canada	2,334	1,980	1,995	2,636	90.0	90.1	89.0	78.9
United Kingdom	80	81	114	403	3.1	3.7	5.1	12.1
Other countries	178	136	132	301	6.9	6.2	5.9	9.0
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*				
Canned— Total	165,912	201,233	266,673	270,369	100.0	100.0	100.0	100.0
Total Europe	138,046	172,367	233,545	232,707	83.2	85.7	87.6	86.1
United Kingdom	120,482	156,798	207,702	203,016	72.6	77.9	77.9	75.1
Other Europe	17,564	15,569	25,843	29,691	10.6	7.8	9.7	11.0
Canada	10,415	9,412	11,149	15,491	6.3	4.7	4.2	5.7
Cuba	6,573	6,637	5,962	4,080	4.0	3.3	2.2	1.5
Other countries	10,878	12,817	16,017	18,091	6.5	6.3	6.0	6.7
Glucose: Total	141,141	136,822	165,589	138,347	100.0	100.0	100.0	100.0
Total Europe	107,359	106,450	131,194	102,195	76.1	77.8	79.2	73.9
United Kingdom	79,681	82,751	101,898	74,079	56.5	60.5	61.5	53.5
Belgium	4,883	3,906	4,270	4,943	3.5	2.9	2.6	3.6
Italy	4,076	3,014	3,585	4,680	2.9	2.2	2.2	3.4
Sweden	3,034	5,489	5,414	3,640	2.1	4.0	3.3	2.6
Other Europe	15,685	11,290	16,027	14,853	11.1	8.2	9.6	10.8
Egypt	8,422	4,708	3,291	4,823	6.0	3.4	2.0	3.5
British South Africa	3,796	3,794	4,565	4,553	2.7	2.8	2.8	3.3
Argentina	3,293	2,415	3,162	3,170	2.3	1.8	1.9	2.3
Other countries	18,271	19,456	23,377	23,606	12.9	14.2	14.1	17.0
Grains and grain products:	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*				
Barley— Total	11,209	23,653	27,181	17,044	100.0	100.0	100.0	100.0
Total Europe	11,020	22,412	21,175	14,254	98.3	94.8	77.9	83.6
United Kingdom	10,390	8,578	13,223	8,981	92.7	36.3	48.6	52.7
Belgium	172	2,225	1,727	1,576	1.5	9.4	6.4	9.2
Germany	33	7,775	3,883	2,066	.3	32.9	14.3	12.1
Netherlands	32	2,526	922	815	.3	10.7	3.4	4.8
Other Europe	393	1,308	1,420	816	3.5	5.5	5.2	4.8
Canada	4	709	5,755	2,184	(3)	3.0	21.2	12.8
Other countries	185	532	251	606	1.7	2.2	.9	3.6
Corn— Total	21,186	8,460	23,137	17,563	100.0	100.0	100.0	100.0
Canada	8,258	4,239	8,071	10,536	39.0	50.1	34.9	60.0
United Kingdom	4,449	141	2,378	1,268	21.0	1.7	10.3	7.2
Cuba	2,615	2,267	2,097	2,016	12.3	26.8	9.1	11.5
Netherlands	2,369	77	3,510	560	11.2	.9	15.2	3.2
Denmark	886	0	999	553	4.2	.0	4.3	3.1
Germany	673	26	742	2	3.2	.3	3.2	(3)
Mexico	337	1,366	4,453	2,124	1.6	16.1	19.2	12.0
Other countries	1,599	344	887	504	7.5	4.1	3.8	3.0

[3] Less than 0.05 per cent.

TABLE 470.—*Destination of principal farm products exported from the United States, 1924–1927*—Continued

Article and country to which exported	Year ended June 30—							
	1924	1925	1926	1927	1924	1925	1926	1927
VEGETABLE PRODUCTS—continued								
Grains and grain products—Contd.	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Oats— Total	1,149	10,874	30,975	9,245	100.0	100.0	100.0	100.0
Total Europe	163	5,596	16,119	2,532	14.2	51.5	52.0	27.4
United Kingdom	142	1,168	4,563	1,259	12.4	10.7	14.7	13.6
Belgium	0	829	2,540	352	.0	7.6	8.2	3.8
France	0	474	4,287	239	.0	4.4	13.8	2.6
Germany	0	1,302	2,632	297	.0	12.0	8.5	3.2
Other Europe	21	1,823	2,097	385	1.8	16.8	6.8	4.2
Canada	198	3,751	13,351	5,198	17.2	34.5	43.1	56.2
Cuba	545	1,264	1,093	1,170	47.4	11.6	3.5	12.7
Mexico	116	99	127	132	10.1	.9	.4	1.4
Other countries	127	164	285	213	11.1	1.5	1.0	2.3
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*				
Oatmeal— Total	137,646	106,256	156,805	104,334	100.0	100.0	100.0	100.0
Total Europe	121,848	87,511	130,684	74,806	88.5	82.4	83.3	71.7
United Kingdom	54,154	32,467	46,526	18,885	39.3	30.6	29.7	18.1
Netherlands	24,186	21,179	31,843	25,930	17.6	19.9	20.3	24.9
Finland	14,209	11,308	17,532	13,219	10.3	10.6	11.2	12.7
Belgium	4,076	5,738	7,057	4,736	3.0	5.4	4.5	4.5
Other Europe	25,223	16,819	27,726	12,036	18.3	15.9	17.6	11.5
Mexico	2,573	3,365	3,993	4,027	1.9	3.2	2.5	3.9
Other countries	13,225	15,380	22,128	25,501	9.6	14.4	14.2	24.4
Rice— Total	190,616	74,602	27,588	234,547	100.0	100.0	100.0	100.0
Total Europe	77,977	43,667	16,467	121,914	40.9	58.5	59.7	52.0
United Kingdom	31,133	21,017	8,071	33,675	16.3	28.2	29.3	14.4
Belgium	9,542	8,398	2,452	18,764	5.0	11.3	8.9	8.0
France	6,526	3,409	273	5,169	3.4	4.6	1.0	2.2
Germany	5,092	3,622	3,417	36,917	2.7	4.9	12.4	15.7
Other Europe	25,684	7,221	2,254	27,389	13.5	9.5	8.1	11.7
Japan	59,703	565	436	68,518	31.3	.8	1.6	29.2
Canada	23,147	7,030	918	7,525	12.1	9.4	3.3	3.2
South America	16,554	16,980	3,315	24,847	8.7	22.8	12.0	10.6
Central America	6,494	3,423	2,302	3,468	3.4	4.6	8.3	1.5
Other countries	6,741	2,937	4,150	8,275	3.6	3.9	15.1	3.5
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*				
Rye— Total	17,705	49,909	12,505	21,613	100.0	100.0	100.0	100.0
Total Europe	9,107	25,381	5,466	7,485	51.4	50.9	43.7	34.6
Germany	4,486	8,344	1,179	1,577	25.3	16.7	9.4	7.3
Norway	1,213	2,933	1,499	489	6.9	5.9	12.0	2.3
Netherlands	892	5,127	1,234	1,768	5.0	10.3	9.9	8.2
Russia in Europe	4	4,348	24	[2]	[3]	8.7	.2	[3]
Other Europe	2,512	4,629	1,530	3,651	14.2	9.3	12.2	16.8
Canada	8,579	24,524	7,017	14,118	48.5	49.1	56.1	65.3
Other countries	19	4	22	10	.1	[3]	.2	.1
	1,000 barrels	*1,000 barrels*	*1,000 barrels*	*1,000 barrels*				
Rye flour— Total	366	55	24	14	100.0	100.0	100.0	100.0
Total Europe	358	48	8	6	97.8	87.3	33.3	42.9
Germany	189	14	0	0	51.6	25.5	.0	.0
Netherlands	70	8	1	0	19.1	14.5	4.2	.0
Sweden	28	16	2	0	7.7	29.1	8.3	.0
France	27	1	0	0	7.4	1.8	.0	.0
Finland	24	1	1	0	6.6	1.8	4.2	.0
Denmark	6	3	1	0	1.6	5.5	4.2	0
Other Europe	14	5	3	6	3.8	9.1	12.4	42.9
Canada	4	4	4	5	1.1	7.3	16.7	35.7
Philippine Islands	[2]	[2]	7	[2]	[3]	[3]	29.2	[3]
Other countries	4	3	5	3	1.1	5.4	20.8	21.4

[2] Less than 500.

[3] Less than 0.05 per cent.

TABLE 470.—*Destination of principal farm products exported from the United States, 1924–1927*—Continued

Article and country to which exported	Year ended June 30— 1924	1925	1926	1927	1924	1925	1926	1927
VEGETABLE PRODUCTS—continued								
Grains and grain products—Contd.	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Wheat—								
Total	78,793	195,490	63,189	156,250	100.0	100.0	100.0	100.0
Total Europe	38,824	130,939	33,893	111,198	49.3	67.0	53.6	71.2
United Kingdom	16,811	40,274	16,335	39,341	21.3	20.6	25.9	25.2
Italy	7,815	25,727	2,877	10,407	9.9	13.2	4.6	6.7
Belgium	4,290	15,178	4,302	8,926	5.4	7.8	6.8	5.7
Netherlands	4,208	16,727	3,720	17,131	5.3	8.6	5.9	11.0
France	2,461	14,290	613	16,079	3.1	7.3	1.0	10.3
Other Europe	3,239	18,743	6,046	19,314	4.3	9.5	9.4	12.3
Canada	17,980	55,597	20,638	26,793	22.8	28.4	32.7	17.1
Japan, including Chosen	10,256	4,100	5,178	7,336	13.0	2.1	8.2	4.7
China	8,301	374	17	1,099	10.5	.2	(3)	.7
Other countries	3,432	4,480	3,463	9,824	4.4	2.3	5.5	6.3
	1,000 barrels	*1,000 barrels*	*1,000 barrels*	*1,000 barrels*				
Wheat flour—								
Total	17,253	13,896	9,542	13,385	100.0	100.0	100.0	100.0
Total Europe	6,598	8,204	3,121	6,063	38.2	59.0	32.7	45.3
Netherlands	1,841	1,781	774	1,568	10.7	12.8	8.1	11.7
Germany	1,488	1,995	340	834	8.6	14.4	3.6	6.2
United Kingdom	1,451	2,105	860	1,733	8.4	15.1	9.0	12.9
Greece	389	582	249	282	2.3	4.2	2.6	2.1
Other Europe	1,429	1,741	898	1,646	8.2	12.5	9.4	12.4
China	2,939	129	489	418	17.0	.9	5.1	3.1
Hong Kong	1,355	450	371	618	7.9	3.2	3.9	4.6
Cuba	1,114	1,233	1,144	1,199	6.5	8.9	12.0	9.0
Other West Indies [1]	958	728	607	747	5.6	5.2	6.4	5.6
Kwantung, leased territory	934	43	266	189	5.4	.3	2.8	1.4
Philippine Islands	585	589	596	666	3.4	4.2	6.2	5.0
Central America	562	576	561	2,356	3.3	4.1	5.9	17.6
Brazil	530	688	864	904	3.1	5.0	9.1	6.8
Other countries	1,678	1,256	1,523	225	9.6	9.2	15.9	1.6
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*				
Hops:								
Total	20,461	16,122	14,098	13,369	100.0	100.0	100.0	100.0
Total Europe	15,769	11,301	10,537	9,378	77.1	70.1	70.3	70.1
United Kingdom	8,341	5,758	4,115	4,559	40.8	35.7	27.4	34.1
Belgium	5,290	4,768	3,791	1,892	25.9	29.6	25.3	14.2
Other Europe	2,138	775	2,631	2,927	10.4	4.8	17.6	21.8
Canada	3,143	3,318	2,937	2,772	15.4	20.6	19.6	20.7
Other countries	1,549	1,503	1,524	1,219	7.5	9.3	10.1	9.2
Oil cake and oil-cake meal:								
Cottonseed cake—								
Total	200,927	593,663	506,582	599,448	100.0	100.0	100.0	100.0
Total Europe	200,353	593,610	505,701	585,526	99.7	100.0	99.8	97.7
Denmark	150,179	434,530	408,114	345,747	74.7	73.2	80.6	57.7
Germany	39,143	100,911	73,489	215,887	19.5	17.0	14.5	36.0
Other Europe	11,031	58,169	24,098	23,892	5.5	9.8	4.7	4.0
Other countries	574	53	881	13,922	.3	(3)	.2	2.3
Cottonseed meal—								
Total	49,439	291,711	209,923	391,068	100.0	100.0	100.0	100.0
Total Europe	44,216	281,122	191,216	360,620	89.4	96.4	91.1	92.2
United Kingdom	35,137	134,855	91,867	150,699	71.1	46.2	43.8	38.5
Germany	4,040	89,502	47,013	127,687	8.2	30.7	22.4	32.7
Norway	3,920	21,194	17,768	28,746	7.9	7.3	8.5	7.4
Other Europe	1,119	35,571	34,568	53,488	2.2	12.2	16.4	13.6
Other countries	5,223	10,589	18,706	30,448	10.6	3.6	8.9	7.8
Linseed or flaxseed cake—								
Total	546,848	671,460	577,908	609,520	100.0	100.0	100.0	100.0
Total Europe	546,760	671,390	577,891	609,394	100.0	100.0	100.0	100.0
Netherlands	361,709	395,439	416,202	381,104	66.2	58.9	72.0	62.5
Belgium	86,468	187,904	125,301	171,487	15.8	28.0	21.7	28.1
United Kingdom	77,040	71,038	26,513	45,522	14.3	10.6	4.6	7.5
Other Europe	20,544	17,009	9,875	11,281	3.7	2.5	1.7	1.9
Other countries	88	70	17	126	(3)	(3)	(3)	(3)

[2] Less than 500.

[3] Less than 0.05 per cent.

TABLE 470.—*Destination of principal farm products exported from the United States, 1924–1927*—Continued

Article and country to which exported	Year ended June 30—							
	1924	1925	1926	1927	1924	1925	1926	1927
VEGETABLE PRODUCTS—continued								
Oils, vegetable:	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Cottonseed— Total	39,418	53,261	59,016	57,580	100.0	100.0	100.0	100.0
Canada	20,516	23,714	36,387	37,683	52.0	44.5	61.7	65.4
Mexico	8,376	3,809	4,362	3,868	21.2	7.2	7.4	6.7
Cuba	2,200	3,914	4,869	2,770	5.6	7.3	8.3	4.8
Norway	1,825	2,079	1,565	2,325	4.6	3.9	2.7	4.0
Argentina	643	1,573	1,536	2,160	1.6	3.0	2.6	3.8
Germany	120	2,405	288	747	.3	4.5	.5	1.3
Netherlands	0	9,252	2,445	350	.0	17.4	4.1	.6
Other countries	5,738	6,515	7,564	7,677	14.7	12.2	12.7	13.4
Starch: Total	262,842	214,247	224,570	233,112	100.0	100.0	100.0	100.0
Total Europe	245,565	195,477	201,191	210,390	93.4	91.2	89.6	90.3
United Kingdom	176,909	161,928	162,051	166,399	67.3	75.6	72.2	71.4
Germany	24,612	128	0	1,455	9.4	.1	.0	.6
Netherlands	15,276	14,939	19,511	18,021	5.8	7.0	8.7	7.7
Other Europe	28,768	18,482	19,629	24,515	10.9	8.5	8.7	10.6
Other countries	17,277	18,770	23,379	22,722	6.6	8.8	10.4	9.7
	1,000 short tons	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*				
Sugar, refined: Total	135	251	300	114	100.0	100.0	100.0	100.0
Total Europe	73	167	217	67	54.1	66.5	72.3	58.8
United Kingdom	40	88	131	37	29.6	35.1	43.7	32.5
France	20	12	12	5	14.8	4.8	4.0	4.4
Greece	4	12	7	3	3.0	4.8	2.3	2.6
Norway	1	12	27	15	.7	4.8	9.0	13.2
Other Europe	8	43	40	7	6.0	17.0	13.3	6.1
Uruguay	24	22	33	19	17.8	8.8	11.0	16.7
Cuba	9	4	1	[2]	6.7	1.6	.3	[3]
Canada	7	9	5	2	5.2	3.6	1.7	1.8
Newfoundland and Labrador	5	5	4	1	3.7	2.0	1.3	.9
Mexico	2	1	2	4	1.5	.4	.7	3.5
Other countries	15	43	38	21	11.0	17.1	12.7	18.3
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*				
Tobacco, leaf: Total	557,288	420,223	528,131	510,186	100.0	100.0	100.0	100.0
Total Europe	406,381	287,352	343,880	346,444	72.9	68.4	65.1	67.9
United Kingdom	161,237	140,772	185,431	154,038	28.9	33.5	35.1	30.2
Germany	55,667	19,126	24,300	31,171	10.0	4.6	4.6	6.1
Netherlands	50,302	15,873	24,155	31,576	9.0	3.8	4.6	6.2
Belgium	35,065	15,203	15,448	31,368	6.3	3.6	2.9	6.1
France	29,376	30,277	54,497	41,834	5.3	7.2	10.3	8.2
Italy	25,207	9,421	10,314	3,408	4.5	2.2	2.0	.7
Spain	22,072	32,746	10	20,774	4.0	7.8	[3]	4.1
Other Europe	27,455	23,934	29,725	32,275	4.9	5.7	5.6	6.3
China	66,017	53,933	98,142	77,216	11.8	12.8	18.6	15.1
Australia	24,389	20,532	22,728	21,821	4.4	4.9	4.3	4.3
Canada	13,157	11,659	13,519	14,541	2.4	2.8	2.6	2.9
Other countries	47,344	46,747	49,862	50,164	8.5	11.1	9.4	9.8
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*				
Potatoes: Total	3,075	3,653	1,824	2,092	100.0	100.0	100.0	100.0
Cuba	1,932	1,869	920	950	62.8	51.2	50.4	45.4
Canada	537	1,038	343	594	17.5	28.4	18.8	28.4
Mexico	203	168	178	139	6.6	4.6	9.9	6.6
Panama	156	195	151	123	5.1	5.3	8.3	5.9
Other countries	247	383	232	286	8.0	10.5	12.7	13.7

Bureau of Agricultural Economics. Compiled from Monthly Summary of Foreign Commerce of the United States, June issues, 1925–1927, and official records of the Bureau of Foreign and Domestic Commerce.

[2] Less than 500. [3] Less than 0.05 per cent.

TABLE 471.—*Origin of principal agricultural products imported into the United States, 1924–1927*

Article and country of origin	Year ended June 30—							
	1924	1925	1926	1927	1924	1925	1926	1927
ANIMALS AND ANIMAL PRODUCTS								
Cattle:	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Total	155	136	215	267	100.0	100.0	100.0	100.0
Canada	141	122	175	168	91.0	89.7	81.4	62.9
Mexico	13	13	39	99	8.4	9.6	18.1	37.0
Other countries	1	1	1	0	.6	.7	.5	.1
Butter:	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*				
Total	29,466	7,189	6,440	10,710	100.0	100.0	100.0	100.0
Total Europe	13,610	1,026	1,754	5,653	46.2	14.3	27.2	52.8
Denmark	10,457	840	873	1,529	35.5	11.7	13.6	14.3
United Kingdom	1,720	52	691	3,932	5.8	.7	10.7	36.7
Other Europe	1,433	134	190	192	4.9	1.9	2.9	1.8
Canada	6,451	3,588	1,111	610	21.9	49.9	17.3	5.7
New Zealand	5,048	1,985	2,232	3,682	17.1	27.6	34.7	34.4
Argentina	4,084	415	1,147	332	13.9	5.8	17.8	3.1
Other countries	273	175	196	433	.9	2.4	3.0	4.0
Cheese:								
Total	66,597	61,489	62,412	89,782	100.0	100.0	100.0	100.0
Total Europe	61,310	59,844	61,859	72,445	92.1	97.3	99.1	80.7
Italy	32,922	32,843	33,822	36,572	49.4	53.4	54.2	40.7
Switzerland	16,140	15,222	15,487	20,638	24.2	24.8	24.8	23.0
France	4,419	4,814	5,855	4,914	6.6	7.8	9.4	5.5
Netherlands	3,048	2,970	3,056	3,687	4.6	4.8	4.9	4.1
Other Europe	4,781	3,995	3,639	6,634	7.3	6.5	5.8	7.4
Canada	1,803	483	164	16,609	2.7	.8	.3	18.5
Other countries	3,484	1,162	389	728	5.2	1.9	.6	.8
Eggs, in the shell:	*1,000 dozen*	*1,000 dozen*	*1,000 dozen*	*1,000 dozen*				
Total	426	682	276	296	100.0	100.0	100.0	100.0
Hong Kong	219	256	189	219	51.4	37.5	68.5	74.0
Canada	142	163	69	54	33.3	23.9	25.0	18.2
China	62	252	16	6	14.6	37.0	5.8	2.0
Other countries	3	11	2	17	.7	1.6	.7	5.8
Eggs and egg yolks (dried, frozen, and preserved):	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*				
Total	18,213	19,067	25,679	18,316	100.0	100.0	100.0	100.0
China	17,366	17,580	21,928	13,873	95.3	92.2	85.4	75.7
United Kingdom	741	1,343	3,130	3,357	4.1	7.0	12.2	18.3
Other countries	106	144	621	1,086	.6	.8	2.4	6.0
Egg albumen:								
Total	7,277	4,363	9,610	7,827	100.0	100.0	100.0	100.0
China	7,166	4,050	8,676	6,907	98.5	92.8	90.3	88.2
Other countries	111	313	934	920	1.5	7.2	9.7	11.8
Hides and skins other than furs:								
Calfskins, dry—								
Total	10,754	8,087	6,103	8,913	100.0	100.0	100.0	100.0
Argentina	1,674	997	233	549	15.6	12.3	3.8	6.2
Latvia	1,303	726	674	1,599	12.1	9.0	11.0	17.9
Finland	1,084	1,003	704	431	10.1	12.4	11.5	4.8
New Zealand	1,012	907	380	574	9.4	11.2	6.2	6.4
Uruguay	775	332	1	20	7.2	4.1	(1)	.2
Canada	735	487	364	374	6.8	6.0	6.0	4.2
Netherlands	510	435	349	340	4.7	5.4	5.7	3.8
United Kingdom	477	98	114	324	4.4	1.2	1.9	3.6
Denmark	475	195	204	268	4.4	2.4	3.3	3.0
Australia	407	187	77	74	3.8	2.3	1.3	.8
Norway	391	801	573	551	3.6	9.9	9.4	6.2

1 Less than 0.05 per cent.

TABLE 471.—*Origin of principal agricultural products imported into the United States, 1924–1927*—Continued

Article and country of origin	Year ended June 30—							
	1924	1925	1926	1927	1924	1925	1926	1927
ANIMALS AND ANIMAL PRODUCTS—con.								
Hides and skins other than furs—Con.	*1000 pounds*	*1000 pounds*	*1000 pounds*	*1000 pounds*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Calfskins, dry—Continued.								
Germany	318	150	675	1,575	3.0	1.9	11.1	17.7
France	199	308	13	177	1.9	3.8	.2	2.0
Poland	135	367	342	527	1.3	4.5	5.6	5.9
Sweden	129	280	144	443	1.2	3.5	2.4	5.0
Russia in Europe	75	12	250	62	.7	.1	4.1	.7
Other countries	1,055	802	1,006	1,025	9.8	10.0	16.5	11.6
Calfskins, wet—Total	18,451	23,155	21,513	30,621	100.0	100.0	100.0	100.0
Canada	5,412	5,519	5,338	7,956	29.3	23.8	24.8	26.0
France	3,396	3,937	3,201	5,349	18.4	17.0	14.9	17.5
United Kingdom	2,154	523	617	1,578	11.7	2.3	2.9	5.2
Sweden	1,296	2,280	1,821	2,647	7.0	9.8	8.5	8.6
Latvia	887	1,149	433	827	4.8	5.0	2.0	2.7
Finland	639	369	768	515	3.5	1.6	3.1	1.7
Switzerland	516	795	1,226	1,506	2.8	3.4	5.7	4.9
Denmark	477	1,038	877	1,223	2.6	4.5	4.1	4.0
Netherlands	425	939	779	1,815	2.3	4.1	3.6	5.9
New Zealand	393	1,234	1,112	1,292	2.1	5.3	5.2	4.2
Italy	374	327	492	636	2.0	1.4	2.3	2.1
Poland	145	1,650	797	756	.8	7.1	3.7	2.5
Belgium	130	329	604	158	.7	1.4	2.8	.5
Other countries	2,207	3,066	3,448	4,363	12.0	13.3	15.9	14.2
Cattle hides, dry—Total	18,112	14,376	14,506	11,287	100.0	100.0	100.0	100.0
Colombia	6,271	5,294	4,666	4,032	34.6	36.8	32.2	35.7
Argentina	2,510	2,040	3,171	682	13.9	14.2	21.9	6.0
Venezuela	2,115	1,925	2,002	1,765	11.7	13.4	13.8	15.6
Canada	1,466	1,114	553	723	8.1	7.7	3.8	6.4
China	1,028	53	336	546	5.7	.4	2.3	4.8
France	605	266	107	361	3.3	1.9	.7	3.2
Australia	489	395	18	0	2.7	2.7	.1	.0
Nicaragua	446	475	354	567	2.5	3.3	2.4	5.0
Uruguay	347	23	86	0	1.9	.2	.6	.0
Honduras	215	181	174	132	1.2	1.3	1.2	1.2
Mexico	240	307	302	325	1.3	2.1	2.1	2.9
United Kingdom	191	180	111	96	1.1	1.3	.8	.9
British India	83	407	206	63	.4	2.8	1.4	.6
Other countries	2,106	1,716	2,420	1,995	11.6	11.9	16.7	17.7
Cattle hides, wet—Total	158,363	184,934	141,081	145,648	100.0	100.0	100.0	100.0
Argentina	99,661	113,565	79,639	74,446	62.9	61.4	56.4	51.1
Canada	28,603	36,084	35,421	43,359	18.1	19.5	25.1	29.8
Uruguay	11,714	8,615	6,252	4,115	7.4	4.7	4.4	2.9
Other countries	18,385	26,670	19,769	23,728	11.6	14.4	14.1	16.2
Goat and kid skins, dry—Total	51,811	57,202	76,619	67,660	100.0	100.0	100.0	100.0
British India	13,174	17,190	26,322	22,483	25.4	30.1	34.4	33.2
China	8,637	8,468	11,356	12,110	16.7	14.8	14.8	17.9
Brazil	4,132	3,858	3,933	4,746	8.0	6.7	5.1	7.0
Spain	3,158	1,642	2,798	1,706	6.1	2.9	3.7	2.5
Argentina	3,131	3,668	4,067	3,501	6.0	6.4	5.3	5.2
Aden	2,855	2,372	4,040	1,875	5.5	4.1	5.3	2.8
Mexico	2,804	4,074	4,751	4,477	5.4	7.1	6.2	6.6
Dutch East Indies	1,634	1,436	2,018	1,985	3.2	2.5	2.6	2.9
Venezuela	1,439	1,403	1,260	1,256	2.8	2.5	1.6	1.9
United Kingdom	1,264	1,992	1,657	1,010	2.4	3.5	2.2	1.5
France	632	1,372	1,278	1,534	1.2	2.4	1.7	2.3
Other countries	8,951	9,727	13,139	10,971	17.3	17.0	17.1	16.2
Goatskins, wet—Total	14,070	8,754	9,865	15,911	100.0	100.0	100.0	100.0
British India	12,990	7,411	8,639	14,424	92.3	84.7	87.6	90.7
Other countries	1,080	1,343	1,226	1,487	7.7	15.3	12.4	9.3

TABLE 471.—*Origin of principal agricultural products imported into the United States, 1924–1927*—Continued

Article and country of origin	Year ended June 30— 1924	1925	1926	1927	1924	1925	1926	1927
ANIMALS AND ANIMAL PRODUCTS—con.								
Hides and skins other than furs—Con.	*1000 pounds*	*1000 pounds*	*1000 pounds*	*1000 pounds*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Kip skins, dry— Total	3,541	1,896	1,218	894	100.0	100.0	100.0	100.0
Argentina	2,381	345	315	161	67.2	18.2	25.9	18.0
United Kingdom	298	188	(2)	119	8.4	9.9	(1)	13.3
France	154	131	119	8	4.3	6.9	9.8	.9
Canada	141	433	212	206	4.0	22.8	17.4	23.0
Sweden	106	82	69	107	3.0	4.3	5.7	12.0
British India	85	103	0	11	2.4	5.4	.0	1.2
British West Africa	40	62	49	0	1.1	3.3	4.0	.0
China	29	0	17	0	.8	.0	1.4	.0
Denmark	0	157	87	0	.0	8.3	7.1	.0
Poland and Danzig	0	148	0	19	.0	7.8	.0	2.1
Netherlands	0	21	86	0	.0	1.1	7.1	.0
Hungary	0	0	0	50	.0	.0	.0	5.6
Belgium	0	0	0	42	.0	.0	.0	4.7
Other countries	307	228	264	171	8.7	12.0	21.6	19.2
Kip skins, wet— Total	7,858	4,997	4,185	4,184	100.0	100.0	100.0	100.0
Argentina	2,927	845	75	221	37.2	16.9	1.8	5.3
France	1,801	1,998	1,023	605	22.9	40.0	24.4	14.5
Canada	1,010	1,185	1,465	2,088	12.9	23.7	35.0	49.9
United Kingdom	464	129	107	53	5.9	2.6	2.5	1.3
China	435	10	0	5	5.5	.2	.0	.1
Netherlands	227	74	464	333	2.9	1.5	11.1	8.0
Belgium	102	39	120	55	1.3	.8	2.9	1.3
Sweden	93	0	28	0	1.2	.0	.7	.0
Italy	59	348	242	359	.8	7.0	5.8	8.5
Other countries	740	369	661	465	9.4	7.3	15.8	11.1
Sheep and lamb skins, dry and wet— Total	61,446	62,303	54,373	59,829	100.0	100.0	100.0	100.0
New Zealand	12,917	16,639	12,161	17,828	21.0	26.7	22.4	29.8
United Kingdom	12,700	13,410	9,160	10,389	20.7	21.5	16.8	17.4
Argentina	12,442	10,531	9,267	10,327	20.2	16.9	17.0	17.3
Brazil	3,559	1,987	2,378	2,265	5.8	3.2	4.4	3.8
Spain	3,057	1,155	1,862	958	5.0	1.8	3.4	1.6
Uruguay	2,757	1,459	2,511	2,588	4.5	2.3	4.6	4.3
Australia	2,674	2,536	3,096	2,411	4.3	4.1	5.7	4.0
Chile	1,775	1,811	1,406	2,667	2.9	2.9	2.6	4.5
Canada	1,462	2,039	1,827	2,208	2.4	3.3	3.4	3.7
British South Africa	1,367	1,466	3,781	2,478	2.2	2.4	7.0	4.1
Other countries	6,736	9,270	6,924	5,710	11.0	14.9	12.7	9.5
Fibers, animal: Silk, raw, in skeins reeled from cocoon— Total	46,172	59,138	64,291	73,402	100.0	100.0	100.0	100.0
Japan	34,445	46,855	51,784	59,934	74.6	79.2	80.5	81.6
China	8,718	8,757	9,519	11,872	18.9	14.8	14.8	16.2
Other countries	3,009	3,526	2,988	1,596	6.5	6.0	4.7	2.2
Wool, unmanufactured— Carpet wool— Total	118,375	138,461	118,079	144,698	100.0	100.0	100.0	100.0
China	57,718	56,591	35,668	36,362	48.8	40.9	30.2	25.1
United Kingdom	29,396	45,521	39,153	51,602	24.8	32.9	33.2	35.7
Argentina	7,759	4,593	6,885	9,513	6.6	3.3	5.8	6.6
Palestine and Syria	4,250	5,223	7,691	8,064	3.6	3.8	6.5	5.6
British India	3,432	5,929	6,804	6,906	2.9	4.3	5.8	4.8
France	2,982	2,979	2,945	5,371	2.5	2.1	2.5	3.7
Other countries	12,838	17,625	18,933	26,880	10.8	12.7	16.0	18.5

[1] Less than 0.05 per cent. [2] Less than 500.

TABLE 471.—*Origin of principal agricultural products imported into the United States, 1924–1927*—Continued

Article and country of origin	Year ended June 30—							
	1924	1925	1926	1927	1924	1925	1926	1927
ANIMALS AND ANIMAL PRODUCTS—con.								
Fibers, animal—Continued.								
Wool, unmanufactured—Contd.	*1,000 pounds*	*1,000 pounds*	*1,090 pounds*	*1,000 pounds*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Clothing wool—Total	12,820	24,446	16,663	16,771	100.0	100.0	100.0	100.0
United Kingdom	4,237	6,882	4,152	4,776	33.0	28.2	24.9	28.5
Argentina	3,101	7,637	2,730	2,842	24.2	31.2	16.4	16.9
Canada	1,145	1,329	843	2,353	8.9	5.4	5.0	14.0
Uruguay	1,138	2,596	1,016	497	8.9	10.6	6.1	3.0
Australia	1,105	1,756	4,560	3,796	8.6	7.2	27.4	22.6
Chile	675	1,568	728	1,186	5.3	6.4	4.4	7.1
Other countries	1,419	2,678	2,634	1,321	11.1	11.0	15.8	7.9
Combing wool—Total	103,003	117,991	204,032	102,908	100.0	100.0	100.0	100.0
Australia	33,131	37,101	59,531	38,714	32.2	31.4	29.2	37.6
United Kingdom	23,751	19,527	27,314	15,484	23.1	16.5	13.4	15.0
Argentina	19,788	18,911	37,292	15,265	19.2	16.0	18.3	14.8
Uruguay	6,572	17,504	37,592	17,751	6.4	14.8	18.4	17.2
New Zealand	5,885	9,869	16,442	5,192	5.7	8.4	8.0	5.0
Other countries	13,826	15,079	25,861	10,502	13.4	12.9	12.7	10.4
Hair of the Angora goat (mohair), alpaca, etc.—Total	4,925	3,809	6,738	6,752	100.0	100.0	100.0	100.0
United Kingdom	1,852	1,084	2,530	792	37.6	28.4	37.5	11.7
Turkey in Europe	1,256	225	1,731	3,146	25.5	5.9	25.7	46.6
Peru	911	603	85	82	18.5	18.2	1.3	1.2
British South Africa	716	1,127	2,319	2,505	14.5	29.6	34.4	37.1
China	135	524	55	74	2.7	13.8	.8	1.1
Other countries	55	156	18	153	1.2	4.1	.3	2.3
Sausage casings: Total	20,386	17,755	19,271	18,844	100.0	100.0	100.0	100.0
Argentina	6,858	5,138	4,690	4,804	33.6	28.9	24.3	25.5
China	2,833	2,350	2,989	2,074	13.9	13.2	15.5	11.0
Canada	2,258	3,624	3,715	3,351	11.1	20.4	19.3	17.8
Australia	1,419	1,564	2,109	2,198	7.0	8.8	10.9	11.7
New Zealand	1,201	1,127	1,357	901	5.9	6.3	7.0	4.8
Uruguay	1,119	517	501	876	5.5	2.9	2.6	4.6
Germany	1,027	481	784	1,904	5.0	2.7	4.1	10.1
Other countries	3,671	2,954	3,126	2,736	18.0	16.8	16.3	14.5
VEGETABLE PRODUCTS								
Cocoa or cacao beans: Total	382,971	382,570	417,060	425,406	100.0	100.0	100.0	100.0
British West Africa	152,533	138,513	135,051	164,338	39.8	36.2	32.4	38.6
Brazil	71,737	71,816	86,110	81,148	18.7	18.8	20.6	19.1
Dominican Republic	42,368	46,926	49,955	51,085	11.1	12.3	12.0	12.0
British West Indies	35,004	36,613	46,061	31,247	9.1	9.6	11.0	7.3
Ecuador	30,310	28,999	34,385	13,709	7.9	7.6	8.2	3.2
Other countries	51,019	59,703	65,498	83,879	13.4	15.5	15.8	19.8
Coffee: Total	1,429,617	1,279,570	1,437,364	1,444,624	100.0	100.0	100.0	100.0
Brazil	950,950	860,269	995,957	1,000,721	66.5	67.2	69.3	69.3
Colombia	254,381	223,170	207,469	313,368	17.8	17.4	14.4	21.7
Central America	90,817	65,975	94,812	40,269	6.4	5.2	6.6	2.8
Other countries	133,469	130,156	139,126	90,266	9.3	10.2	9.7	6.2
Fibers, vegetable:								
Cotton, raw—Total	146,024	155,092	161,453	190,963	100.0	100.0	100.0	100.0
Egypt	78,631	91,930	112,633	102,280	53.8	59.3	69.8	53.6
China	21,577	15,942	12,787	14,536	14.8	10.3	7.9	7.6
British India	16,302	13,044	11,123	9,240	11.2	8.4	6.9	4.8
Mexico	13,443	22,287	11,776	46,550	9.2	14.4	7.3	24.4
Peru	9,956	5,678	7,469	8,650	6.8	3.7	4.6	4.5
Other countries	6,115	6,211	5,665	9,707	4.2	3.9	3.5	5.1

TABLE 471.—*Origin of principal agricultural products imported into the United States, 1924–1927*—Continued

Article and country of origin	Year ended June 30—							
	1924	1925	1926	1927	1924	1925	1926	1927
VEGETABLE PRODUCTS—continued								
Fibers, vegetable—Continued.								
Flax, unmanufactured—	*Tons*	*Tons*	*Tons*	*Tons*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Total	4,885	4,315	7,104	4,705	100.0	100.0	100.0	100.0
Total Europe	3,163	3,563	6,543	4,294	64.7	82.6	92.1	91.3
United Kingdom	1,699	1,595	1,759	1,231	34.8	37.0	24.8	26.2
Belgium	290	520	630	446	5.9	12.0	8.9	9.5
Estonia	176	68	1,126	566	3.6	1.6	15.8	12.0
Netherlands	170	141	439	287	3.5	3.3	6.2	6.1
Russia in Europe	108	198	1,565	642	2.2	4.6	22.0	13.6
Other Europe	720	1,041	1,024	1,122	14.7	24.1	14.4	23.9
Canada	1,292	499	263	45	26.4	11.6	3.7	1.0
Other countries	430	253	298	366	8.9	5.8	4.2	7.7
Manila fiber—	*1,000 tons*	*1,000 tons*	*1,000 tons*	*1,000 tons*				
Total	98	73	62	61	100.0	100.0	100.0	100.0
Philippine Islands	97	72	62	60	99.0	98.6	100.0	98.4
Other countries	1	1	(2)	1	1.0	1.4	(1)	1.6
Sisal and henequen—								
Total	97	146	126	116	100.0	100.0	100.0	100.0
Mexico	71	116	96	82	73.2	79.4	76.2	70.7
Dutch East Indies	11	14	14	19	11.3	9.6	11.1	16.4
Other countries	15	16	16	15	15.5	11.0	12.7	12.9
Fruits:								
Dried—	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*				
Currants—								
Total	17,155	15,064	14,773	13,011	100.0	100.0	100.0	100.0
Total Europe	17,005	14,887	14,635	12,913	99.0	98.8	99.1	99.2
Greece	16,810	14,676	14,032	12,714	98.0	97.4	95.0	97.7
Other Europe	195	211	603	199	1.1	1.4	4.1	1.5
Other countries	150	177	138	98	.9	1.2	.9	.8
Dates—								
Total	44,143	63,444	70,195	43,434	100.0	100.0	100.0	100.0
Hejaz, Arabia, etc.	36,530	35,498	59,623	32,828	82.8	56.0	84.9	75.6
Turkey in Asia	2,811	4,321	191	61	6.4	6.8	.3	.1
United Kingdom	1,582	12,871	5,800	3,413	3.6	20.3	8.3	7.9
Palestine and Syria	(2)	8,668	0	0	(1)	13.7	.0	.0
Other countries	3,220	2,086	4,581	7,132	7.2	3.2	6.5	16.4
Figs—								
Total	31,668	45,259	43,681	39,504	100.0	100.0	100.0	100.0
Turkey in Asia	19,689	22,157	20,589	21,893	62.2	49.0	47.1	55.4
Greece	4,457	7,596	4,615	6,842	14.1	16.8	10.6	17.3
Portugal	3,866	4,794	8,366	2,786	12.2	10.6	19.2	7.1
Italy	1,526	3,793	3,722	3,305	4.8	8.4	8.5	8.4
Other countries	2,130	6,919	6,389	4,678	6.7	15.2	14.6	11.8
Fresh—	*1,000 bunches*	*1,000 bunches*	*1,000 bunches*	*1,000 bunches*				
Bananas—								
Total	44,935	50,513	58,550	57,102	100.0	100.0	100.0	100.0
Central America	27,977	31,982	34,840	32,208	62.3	63.3	59.5	56.4
Jamaica	9,407	10,635	14,766	13,861	20.9	21.0	25.2	24.3
Colombia	2,344	2,260	2,431	2,073	5.2	4.5	4.2	3.6
Cuba	2,277	2,119	2,932	2,905	5.1	4.2	5.0	5.1
Other countries	2,930	3,517	3,581	6,055	6.5	7.0	6.1	10.6
Lemons [3]—	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*	*1,000 boxes*				
Total	1,018	1,264	1,247	659	100.0	100.0	100.0	100.0
Total Europe	1,015	1,262	1,244	659	99.7	99.8	99.8	100.0
Italy	1,010	1,261	1,235	654	99.2	99.8	99.0	99.2
Other Europe	5	1	9	5	.5	(1)	.8	.8
Other countries	3	2	3	0	.3	.2	.2	.0

[1] Less than 0.05 per cent. [2] Less than 500. [3] Boxes of 74 pounds.

TABLE 471.—*Origin of principal agricultural products imported into the United States, 1924–1927*—Continued

Article and country of origin	Year ended June 30—							
	1924	1925	1926	1927	1924	1925	1926	1927
VEGETABLE PRODUCTS—continued								
Fruits—Continued.								
Fresh—Continued.	*1,000 gallons*	*1,0000 gallons*	*1,000 gallons*	*1,000 gallons*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Olives—Total	6,848	5,901	5,992	5,212	100.0	100.0	100.0	100.0
Total Europe	6,785	5,874	5,950	5,185	99.1	99.5	99.3	99.5
Spain	5,030	4,259	4,466	4,664	73.5	72.2	74.5	89.5
Greece	1,248	1,070	1,127	96	18.2	18.1	18.8	1.8
Other Europe	507	545	357	425	7.4	9.2	6.0	8.2
Other countries	63	27	42	27	.9	.5	.7	.5
Grains:	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*				
Rice, cleaned—except patna. Total	32,193	41,639	92,629	54,088	100.0	100.0	100.0	100.0
Hong Kong	21,267	24,942	21,301	19,741	66.1	59.9	23.0	36.5
Germany	3,270	3,020	10,038	3,768	10.1	7.3	10.8	7.0
Netherlands	1,823	4,858	34,692	5,837	5.7	11.7	37.4	10.8
French Indo-China	1,770	418	0	388	5.5	1.0	.0	.7
China	1,637	1,674	1,442	153	5.1	4.0	1.6	.3
Italy	528	633	3,664	3,695	1.6	1.5	4.0	6.8
British India	524	2,006	2,879	465	1.6	4.8	3.1	.8
United Kingdom	296	0	2,332	692	.9	.0	2.5	1.3
Mexico	187	2,853	4,170	8,002	6	6.9	4.5	14.8
Siam	0	97	112	2,912	.0	.2	.1	5.4
Other countries	891	1,138	11,999	8,435	2.8	2.7	13.0	15.6
Rice, uncleaned—Total	5,118	12,024	30,749	11,728	100.0	100.0	100.0	100.0
Mexico	2,543	(2)	13,708	7,802	49.7	(1)	44.6	66.5
Japan	2,326	11,604	11,686	3,213	45.4	96.5	38.0	27.4
Other countries	249	420	5,355	713	4.9	3.5	17.4	6.1
Rice, flour and meal—Total	900	4,013	6,588	2,972	100.0	100.0	100.0	100.0
Japan	388	417	440	469	43.1	10.4	6.7	15.8
Hong Kong	201	166	102	96	22.3	4.1	1.5	3.2
Germany	159	2,803	164	(2)	17.7	69.8	2.5	(1)
Netherlands	60	0	3,189	0	6.7	.0	48.4	.0
Mexico	0	606	2,546	2,307	.0	15.1	38.6	77.6
Other countries	92	21	147	100	10.2	.6	2.3	3.4
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*				
Wheat—Total	27,284	6,169	15,598	13,235	100.0	100.0	100.0	100.0
Canada	27,277	6,169	15,596	13,234	100.0	100.0	100.0	100.0
Other countries	7	(2)	2	1	(1)	(1)	(1)	(1)
	1,000 barrels	*1,000 barrels*	*1,000 barrels*	*1,000 barrels*				
Wheat flour—Total	169	7	17	6	100.0	100.0	100.0	100.0
Canada	169	6	17	5	100.0	85.7	100.0	83.3
Other countries	(2)	1	(2)	1	(1)	14.3	(1)	16.7
Nuts:	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*				
Almonds, shelled—Total	23,411	21,362	18,575	15,699	100.0	100.0	100.0	100.0
Total Europe	23,251	21,180	18,280	15,171	99.3	99.1	98.4	96.6
Spain	14,129	8,828	12,801	8,389	60.4	41.3	68.9	53.4
Italy	8,259	10,522	4,156	6,076	35.3	49.3	22.4	38.7
France	764	1,542	1,142	541	3.3	7.2	6.1	3.4
Other Europe	99	288	181	165	.3	1.3	1.0	1.1
Other countries	160	182	295	528	.7	.9	1.6	3.4

[1] Less than 0.05 per cent. [2] Less than 500.

TABLE 471.—*Origin of principal agricultural products imported into the United States, 1924–1927*—Continued

Article and country of origin	Year ended June 30—							
	1924	1925	1926	1927	1924	1925	1926	1927
VEGETABLE PRODUCTS—continued								
Nuts—Continued.	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Almonds, not shelled—Total	2,654	3,802	3,703	638	100.0	100.0	100.0	100.0
Total Europe	2,609	3,794	3,670	499	98.3	99.8	99.1	78.2
Spain	2,238	3,008	3,127	158	84.3	79.1	84.4	24.8
France	231	475	335	154	10.6	12.5	9.0	24.1
Italy	89	38	156	180	3.4	1.0	4.2	28.2
Other Europe	1	273	52	7	(1)	7.2	1.5	1.1
Brazil	0	0	0	130	.0	.0	.0	20.4
Other countries	45	8	33	9	1.7	.2	.9	1.4
Filberts, shelled—Total	7,353	4,345	6,669	4,750	100.0	100.0	100.0	100.0
Total Europe	7,165	4,212	6,489	4,635	97.4	96.9	97.3	97.6
Spain	3,017	2,197	669	421	41.0	50.6	10.0	8.9
Turkey in Europe	2,066	775	2,325	1,910	28.1	17.8	34.9	40.2
France	1,474	924	2,150	1,014	20.0	21.3	32.2	21.3
Other Europe	608	316	1,345	1,290	8.3	7.2	20.2	27.2
Other countries	188	133	180	115	2.6	3.1	2.7	2.4
Filberts, not shelled—Total	14,111	9,326	11,105	9,822	100.0	100.0	100.0	100.0
Total Europe	14,110	9,325	11,032	9,690	100.0	100.0	99.3	98.7
Italy	14,038	7,185	8,546	9,296	99.5	77.0	77.0	94.6
Spain	45	2,090	714	49	.3	22.4	6.4	.5
Other Europe	27	50	1,772	345	.2	.6	15.9	3.6
Other countries	1	1	73	132	(1)	(1)	.7	1.3
Peanuts, shelled—Total	48,310	85,610	33,666	46,852	100.0	100.0	100.0	100.0
China	42,044	83,786	32,351	44,729	87.0	97.9	96.1	95.5
Other countries	6,266	1,824	1,315	2,123	13.0	2.1	3.9	4.5
Peanuts, not shelled—Total	3,561	11,371	3,539	4,410	100.0	100.0	100.0	100.0
China	3,055	9,357	2,837	3,812	85.8	82.2	80.2	86.4
Japan, including Chosen	410	1,543	235	245	11.5	13.6	6.6	5.6
Other countries	96	471	467	353	2.7	4.2	13.2	8.0
Walnuts, shelled—Total	18,765	23,640	22,680	20,979	100.0	100.0	100.0	100.0
Total Europe	16,566	19,630	19,296	12,002	88.2	83.0	85.1	57.2
France	15,234	17,051	17,474	8,995	81.2	72.1	77.0	42.9
Other Europe	1,322	2,579	1,822	3,007	7.0	10.9	8.1	14.3
China	1,756	3,424	2,020	8,144	9.4	14.5	13.3	38.8
Other countries	453	586	364	833	2.4	2.5	1.6	4.0
Walnuts, not shelled—Total	18,245	30,912	21,472	25,706	100.0	100.0	100.0	100.0
Total Europe	15,857	23,046	18,408	18,652	86.9	74.6	85.7	72.6
Italy	10,389	11,477	9,064	12,082	56.9	37.1	42.2	47.0
France	4,623	9,222	6,798	3,566	25.3	29.8	31.7	13.9
Other Europe	845	2,347	2,546	3,004	4.7	7.7	11.8	11.7
China	1,952	6,332	2,395	5,870	10.7	20.5	11.2	22.8
Other countries	436	1,534	669	1,184	2.4	4.9	3.1	4.6
Oils, vegetable: Coconut oil—product of Philippine Islands	181,013	250,121	200,878	286,776	100.0	100.0	100.0	100.0

[1] Less than 0.05 per cent.

TABLE 471.—*Origin of principal agricultural products imported into the United States, 1924–1927*—Continued

Article and country of origin	Year ended June 30—							
	1924	1925	1926	1927	1924	1925	1926	1927
VEGETABLE PRODUCTS—continued								
Oils, vegetables—Continued.	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Olive oil, edible—Total	80,881	80,302	83,178	87,922	100.0	100.0	100.0	100.0
Total Europe	79,725	78,536	81,666	86,393	98.6	97.8	98.2	98.3
Italy	52,076	58,380	57,821	58,706	64.4	72.7	69.5	66.8
Spain	19,561	11,324	17,147	21,682	24.2	14.1	20.6	24.7
France	6,118	6,051	5,647	4,705	7.6	7.5	6.8	5.4
Other Europe	1,970	2,781	1,051	1,300	2.4	3.5	1.3	1.4
Other countries	1,156	1,766	1,512	1,529	1.4	2.2	1.8	1.7
Soy-bean oil—Total	17,631	20,434	17,401	23,553	100.0	100.0	100.0	100.0
Kwantung	16,034	15,492	13,801	15,759	90.9	75.8	79.3	66.9
Japan	21	180	2,801	4,033	.1	.9	16.1	17.1
China	1,535	3,431	1	1,803	8.7	16.8	(1)	7.7
Other countries	41	1,331	798	1,958	.3	6.5	4.6	8.3
Oilseeds:								
Copra, not prepared—Total	299,774	328,652	392,759	454,546	100.0	100.0	100.0	100.0
Philippine Islands	244,928	260,076	247,587	330,946	81.7	79.1	63.3	72.8
British Oceania	22,013	8,912	27,600	19,131	7.3	2.7	7.0	4.2
French Oceania	18,879	27,132	24,799	29,188	6.3	8.3	6.3	6.4
British East Indies	3,162	13,303	70,386	59,746	1.1	4.0	17.9	13.1
Other countries	10,792	19,229	21,387	15,535	3.6	5.9	5.5	3.5
	1,000 bushels	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*				
Flaxseed—Total	19,577	13,419	19,354	24,224	100.0	100.0	100.0	100.0
Argentina	16,169	8,255	16,375	20,581	82.6	61.5	84.6	85.0
Canada	3,365	5,137	2,949	3,429	17.2	38.3	15.2	14.2
Other countries	43	27	30	214	.2	.2	.2	.8
Seeds, except oilseeds:								
Clover seed—								
Clover, red—	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*				
Total	24,287	6,494	19,589	11,012	100.0	100.0	100.0	100.0
Total Europe	23,025	6,148	18,899	10,702	94.8	94.7	96.5	97.2
France	17,095	4,843	18,336	10,173	70.4	74.6	93.6	92.4
United Kingdom	3,884	409	(2)	198	16.0	6.3	(1)	1.8
Italy	975	194	65	32	4.0	3.0	.3	.3
Germany	733	519	377	251	3.0	8.0	1.9	2.3
Other Europe	338	183	121	48	1.4	2.8	.7	.4
Other countries	1,262	346	690	310	5.2	5.3	3.5	2.8
All other, including alsike, crimson, and all other clover—Total	28,804	22,893	29,093	14,333	100.0	100.0	100.0	100.0
Total Europe	10,122	6,273	8,405	3,581	35.1	27.4	28.9	25.0
France	6,081	4,521	5,826	1,561	21.1	19.7	20.0	10.9
Germany	1,432	868	965	455	5.0	3.8	3.3	3.2
Other Europe	2,609	884	1,614	1,565	9.0	3.9	5.6	10.9
Canada	18,514	16,615	20,679	10,745	64.3	72.6	71.1	75.0
Other countries	168	5	9	7	.6	(1)	(1)	(1)
Spices:								
Pepper, unground—Total	27,335	37,505	28,221	25,217	100.0	100.0	100.0	100.0
Dutch East Indies	21,794	27,297	12,745	6,636	79.7	72.8	45.2	26.3
British Malaya	3,073	4,250	2,419	2,287	11.2	11.3	8.6	9.1
British India	1,311	3,496	9,533	11,048	4.8	9.3	33.8	43.8
Other countries	1,157	2,462	3,524	5,246	4.3	6.6	12.4	20.8

[1] Less than 0.05 per cent. [2] Less than 500.

TABLE 471.—*Origin of principal agricultural products imported into the United States, 1924–1927*—Continued

Article and country of origin	Year ended June 30— 1924	1925	1926	1927	1924	1925	1926	1927
VEGETABLE PRODUCTS—continued								
Sugar, raw, cane:	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Total	3,765	4,337	4,420	4,320	100.0	100.0	100.0	100.0
Cuba	3,258	3,858	3,861	3,853	86.5	89.0	87.4	89.2
Philippine Islands	315	383	510	428	8.4	8.8	11.5	9.9
Other countries	192	96	49	39	5.1	2.2	1.1	.9
Tea:	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*				
Total	105,443	92,779	99,411	97,402	100.0	100.0	100.0	100.0
Japan	34,297	28,529	29,135	28,430	32.5	30.7	29.3	29.2
British East Indies	23,721	24,785	17,994	24,704	22.5	26.7	18.1	25.4
China	18,539	10,322	13,713	11,655	17.6	11.1	13.8	12.0
United Kingdom	17,781	18,986	22,928	22,136	16.9	20.5	23.1	22.7
Dutch East Indies	8,673	6,202	8,264	7,660	8.2	6.7	8.3	7.9
Other countries	2,432	3,955	7,377	2,817	2.3	4.3	7.4	2.8
Tobacco, leaf, unmanufactured:								
Leaf, product of Philippine Islands	1,145	1,130	1,129	1,092	100.0	100.0	100.0	100.0
Leaf, for cigar wrappers— Total	6,414	5,766	6,590	6,473	100.0	100.0	100.0	100.0
Netherlands	6,220	5,608	6,354	6,358	97.0	97.3	96.4	98.2
Other countries	194	158	236	115	3.0	2.7	3.6	1.8
All other leaf— Total	44,821	68,235	60,561	83,499	100.0	100.0	100.0	100.0
Cuba	18,265	20,737	20,976	24,233	40.8	30.4	34.6	29.0
Greece	12,888	27,725	13,342	28,383	28.8	40.6	22.0	34.0
Italy	4,089	9,537	12,412	13,708	9.1	14.0	20.5	16.4
Germany	3,814	1,649	141	973	8.5	2.4	.2	1.2
Turkey in Asia	1,350	6,508	10,130	8,094	3.0	9.5	16.7	9.7
Other countries	4,415	2,079	3,560	8,108	9.8	3.1	6.0	9.7
Vegetables:	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*	*1,000 bushels*				
Onions— Total	1,406	2,075	2,194	2,298	100.0	100.0	100.0	100.0
Spain	1,098	1,090	1,342	1,084	78.1	52.5	61.2	47.2
Egypt	148	618	599	912	10.5	29.8	27.3	39.7
United Kingdom	52	71	36	59	3.7	3.4	1.6	2.6
Other countries	108	296	217	243	7.7	14.3	9.9	10.5
Potatoes, natural state— Total	564	478	5,420	6,347	100.0	100.0	100.0	100.0
Canada	452	394	5,104	6,010	80.1	82.4	94.2	94.7
Bermuda	87	60	95	92	15.4	12.6	1.8	1.4
Other countries	25	24	221	245	4.5	5.0	4.0	3.9
FOREST PRODUCTS								
India rubber, crude:	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*				
Total	617,102	801,275	921,964	962,467	100.0	100.0	100.0	100.0
British East Indies	416,837	503,175	630,753	694,966	67.5	62.8	68.4	72.2
Dutch East Indies	115,234	146,008	157,150	156,772	18.7	18.2	17.0	16.3
United Kingdom	47,513	101,749	60,706	55,155	7.7	12.7	6.6	5.7
Other countries	37,518	50,343	73,355	55,574	6.1	6.3	8.0	5.8

Bureau of Agricultural Economics. Compiled from Monthly Summary of Foreign Commerce of the United States, June issues, 1925–1927, and official records of the Bureau of Foreign and Domestic Commerce.

TABLE 472.—*Foreign trade of the United States in agricultural products: Comparative summary, 1909–1927*

Year ended June 30—	Agricultural exports [1]			Agricultural imports [1]		Excess of agricultural exports (+) or of imports (−)	Forest products			
	Domestic		Foreign	Total	Percentage of all imports		Exports		Imports	Excess of exports (+) or of imports (−)
	Total	Percentage of all exports					Domestic	Foreign		
	1,000 dollars	*Per cent*	*1,000 dollars*	*1,000 dollars*	*Per cent*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*
1909	903, 238	55. 1	9, 585	638, 613	48. 7	+274, 210	72, 442	4, 983	123, 920	−46, 495
1910	871, 158	50. 9	14, 470	687, 509	44. 2	+198, 119	85, 030	9, 802	178. 872	−84, 040
1911	1, 030, 794	51. 2	14, 665	680, 205	44. 5	+365, 254	103, 039	7, 587	162, 312	−51, 686
1912	1, 050, 627	48. 4	12, 108	783, 457	47. 4	+279, 277	108, 122	6, 413	172, 523	−57, 988
1913	1, 123, 652	46. 3	15, 029	815, 301	45. 0	+323, 381	124, 836	7, 432	180, 502	−48, 235
1914	1, 113, 974	47. 8	17, 729	924, 247	48. 8	+207, 456	106, 979	4, 518	155, 261	−43, 765
1915	1, 475, 938	54. 3	34, 420	910, 786	54. 4	+599, 571	52. 554	5, 089	165, 849	−108, 207
1916	1, 518, 071	35. 5	42, 088	1, 189, 705	54. 1	+370, 454	68, 155	4, 364	252, 851	−180, 331
1917	1, 968, 253	31. 6	37, 640	1, 404, 972	52. 8	+600, 921	68, 919	11, 172	322, 693	−242, 609
1918	2, 280, 466	39. 1	39, 553	1, 618, 874	55. 0	+701, 144	87, 181	6, 066	335, 033	−241, 787
1919	3, 579, 918	50. 6	103, 530	1, 768, 191	57. 1	+1, 915, 257	113, 275	6, 004	293, 781	−174, 501
1920	3, 861, 511	48. 6	122, 598	3, 129, 659	59. 7	+854, 450	190, 049	11, 026	508, 410	−307, 334
1921	2, 607, 641	40. 8	87, 019	1, 941, 837	53. 1	+752, 823	141, 876	7, 805	343, 141	−193, 460
1922	1, 915, 866	51. 8	40, 783	1, 282, 880	49. 2	+673, 769	94, 115	5, 120	245, 474	−146, 239
1923	1, 799, 168	46. 3	43, 359	1, 905, 245	50. 4	−62, 718	129, 981	6, 989	405, 725	−268, 755
1924	1, 867, 098	44. 2	57, 640	1, 716, 994	48. 3	+207, 744	162, 374	6, 642	374, 339	−205, 323
1925	2, 280, 381	47. 7	54, 492	1, 818, 578	47. 6	+516, 295	156, 187	11, 530	465, 464	−297, 747
1926	1, 891, 739	40. 7	48, 532	1, 918, 266	43. 0	+22, 005	162, 731	28, 074	848, 492	−657, 687
1927	1, 907, 851	39. 2	50, 531	1, 906, 150	44. 8	+52, 232	172, 943	23, 053	613, 132	−417, 136

Bureau of Agricultural Economics. Compiled from Foreign Commerce and Navigation of the United States, 1909–1918, and Monthly Summary of Foreign Commerce of the United States, June issues, 1920–1927. All values are gold.

[1] Not including forest products.

MISCELLANEOUS AGRICULTURAL STATISTICS

CROP SUMMARY

TABLE 473.—*Acreage, production, and yield per acre, 1925–1927*

Crop	Acreage			Unit	Production			Yield per acre		
	1925	1926	1927		1925	1926	1927	1925	1926	1927
	1,000 acres	*1,000 acres*	*1,000 acres*		*Thousands*	*Thousands*	*Thousands*			
Corn	101, 359	99, 713	98, 914	Bushel	2, 916, 961	2, 692, 217	2, 786, 288	28. 8	27. 0	28. 2
Winter wheat	31, 234	36, 987	37, 872	do	401, 734	627, 433	552, 384	12. 9	17. 0	14. 6
Spring wheat [1]	21, 021	19, 350	20, 711	do	274, 695	203, 607	319, 307	13. 1	10. 5	15. 4
All wheat	52, 255	56, 337	58, 583	do	676, 429	831, 040	871, 691	12. 9	14. 8	14. 9
Oats	44, 872	44, 177	42, 227	do	1, 487, 550	1, 246, 848	1, 195, 006	33. 2	28. 2	28. 3
Barley	7, 997	7, 970	9, 492	do	213, 863	184, 905	265, 577	26. 7	23. 2	28. 0
Rye	3, 974	3, 578	3, 670	do	46, 456	40, 795	58, 572	11. 7	11. 4	16. 0
Buckwheat	747	694	832	do	13, 994	12, 676	16, 182	18. 7	18. 3	19. 4
Flaxseed	3, 078	2, 907	2, 907	do	22, 424	19, 335	26, 583	7. 3	6. 7	9. 1
Rice	889	1, 034	989	do	33, 309	41, 730	40, 231	37. 5	40. 4	40. 7
Grain sorghums [2]	6, 618	6, 690	6, 733	do	106, 390	137, 515	137, 608	16. 0	20. 6	20. 4
Cotton	46, 053	47, 087	40, 168	Bale	16, 104	17, 977	12, 789	[3] 167. 2	[3] 182. 6	[3] 152. 3
Cottonseed	------	------	------	Ton	7, 150	7, 982	5, 678	------	------	------
Hay, tame	58, 231	58, 791	61, 196	do	85, 717	86, 497	106, 219	1. 47	1. 47	1. 74
Hay, wild	14, 560	12, 911	14, 787	do	12, 724	9, 568	17, 293	. 87	. 74	1. 17
All hay	72, 791	71, 702	75, 983	do	98, 441	96, 065	123, 512	1. 35	1. 34	1. 63
Cloverseed	823	530	1, 208	Bushel	1, 113	728	1, 738	1. 35	1. 37	1. 44
Beans, dry edible [2]	1, 606	1, 649	1, 605	do	19, 928	17, 396	16, 872	12. 4	10. 5	10. 5
Soy beans [4]	431	543	653	do	5, 102	6, 094	8, 163	11. 84	11. 22	12. 50
Peanuts	958	843	1, 132	Pound	698, 475	631, 825	866, 822	729. 1	749. 5	765. 7
Cowpeas [4]	570	771	1, 035	Bushel	4, 214	4, 335	5, 834	7. 39	5. 62	5. 64
Velvet beans	1, 627	1, 353	1, 561	Ton	[5] 438	[5] 571	[5] 731	[3] 538. 4	[3] 844. 1	[3] 936. 6
Potatoes	3, 092	3, 122	3, 505	Bushel	323, 465	354, 328	402, 149	104. 6	113. 5	114. 7
Sweet potatoes	779	819	931	do	62, 319	82, 703	93, 928	80. 0	101. 0	100. 9
Tobacco	1, 757	1, 656	1, 610	Pound	1, 376, 628	1, 297, 889	1, 237, 832	783. 3	783. 6	768. 7
Sugar cane except for sirup (La.).	236	163	102	Ton	3, 290	1, 105	1, 428	14. 0	6. 8	14. 0
Cane sirup	125	132	120	Gallon	20, 400	22, 172	21, 425	163. 2	168. 0	178. 5
Sugar beets	647	677	722	Ton	7, 366	7, 223	7, 737	11. 4	10. 7	10. 7
Sorghum sirup	370	387	386	Gallon	24, 926	34, 547	31, 876	67. 4	89. 3	82. 6
Maple sugar and sirup (as sugar).	[6] 13,051	[6] 13,012	[6] 12,937	Pound	23, 902	28, 772	28, 566	[7] 1. 83	[7] 2. 21	[7] 2. 21
Broomcorn [2]	223	308	218	Ton	30	53	36	[3] 264. 6	[3] 346. 8	[3] 327. 4
Hops [2]	20	21	25	Pound	28, 573	31, 522	29, 794	1,404.1	1,515.5	1,211.1
FRUIT CROPS										
Apples total	------	------	------	Bushel	172, 389	246, 524	123, 455	------	------	------
Apples, commercial	------	------	------	Barrel	33, 246	39, 119	25, 900	------	------	------
Peaches	------	------	------	Bushel	46, 562	69, 865	45, 463	------	------	------
Pears	------	------	------	do	20, 720	25, 249	18, 072	------	------	------
Grapes	------	------	------	Ton	2, 064	2, 423	2, 465	------	------	------
Oranges (2 States)	------	------	------	Box	33, 300	38, 867	32, 540	------	------	------
Grapefruit (Fla.)	------	------	------	do	------	7, 800	6, 300	------	------	------
Lemons (Calif.)	------	------	------	do	------	7, 712	6, 400	------	------	------
Cranberries [2]	28	28	28	Barrel	569	744	495	20. 3	26. 1	17. 4
COMMERCIAL TRUCK CROPS										
Asparagus	66	85	90	Crate	6, 301	7, 813	7, 874	96	92	87
Beans, snap	103	95	112	Ton	145	110	122	1. 4	1. 2	1. 1
Cabbage	120	129	138	do	947	1, 034	1, 163	7. 9	8. 0	8. 4
Cantaloupes	93	102	107	Crate	14, 553	14, 393	15, 272	156	142	142
Carrots	15	19	26	Bushel	4, 230	5, 523	8, 002	287	291	307
Cauliflower	15	23	17	Crate	3, 403	5, 538	4, 299	224	240	248
Celery	23	24	25	do	6, 685	6, 476	7, 407	293	268	293
Corn, sweet (canning)	394	317	214	Ton	1, 014	816	396	2. 6	2. 6	1. 9
Cucumbers	139	109	98	Bushel	12, 208	8, 855	8, 360	87	81	85
Eggplant	3	3	3	do	904	791	746	259	243	260
Lettuce	86	106	122	Crate	16, 076	17, 150	17, 652	187	162	144
Onions	65	74	75	Bushel	19, 423	20, 945	22, 476	299	282	298
Peas, green	200	262	218	Ton	242	261	237	. 9	1. 0	1. 1
Peppers	14	15	15	Bushel	3, 455	3, 890	3, 502	252	254	240

[1] Including durum.
[2] Principal producing States.
[3] Pounds.
[4] Equivalent solid acres grown for the grain, and total bushels of shelled beans and peas gathered. Figures for 1926 and 1927 on new basis.
[5] Total production of beans in the pod, including those grazed.
[6] Trees tapped.
[7] Per tree.

TABLE 473.—*Acreage, production, and yield per acre, 1925–1927*—Continued

Crop	Acreage			Unit	Production			Yield per acre		
	1925	1926	1927		1925	1926	1927	1925	1926	1927
COMMERCIAL TRUCK CROPS—continued	*1,000 acres*	*1,000 acres*	*1,000 acres*		*Thousands*	*Thousands*	*Thousands*			
Potatoes, early [8]	299	309	332	do	30, 466	34, 615	40, 567	102	112	122
Spinach	45	52	54	Ton	107	124	141	2. 4	2. 4	2. 6
Strawberries	145	152	188	Quart	228, 577	277, 940	342, 284	1,576	1,823	1,819
Tomatoes	484	372	387	Ton	2, 322	1, 376	1, 622	4. 8	3. 7	4. 2
Watermelons	174	199	181	Car	56	70	57	[9] 325	[9] 350	[9] 316
Total	356, 199	357, 029	357, 409							

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

[8] This item is included in the item "potatoes" shown in the first column of this table and appears only once in the "total."
[9] Number.

TABLE 474.—*Acreage of 19 principal crops, by States, 1919–1927*

[Aggregate acreage of corn, wheat, oats, barley, rye, buckwheat, potatoes, sweet potatoes, tobacco, flax, rice, all hay, cotton, peanuts, grain sorghums, beans, broomcorn, hops, and cranberries]

State	Acreage of crops named									Total acreage in specified crops [1]
	1919	1920	1921	1922	1923	1924	1925	1926	1927	
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*Per cent*
Maine	1, 518	1, 536	1, 571	1, 537	1, 547	1, 592	1, 592	1, 591	1, 586	96
New Hampshire	507	520	520	523	512	523	523	523	518	94
Vermont	1, 137	1, 142	1, 122	1, 139	1, 140	1, 141	1, 141	1, 141	1, 137	93
Massachusetts	552	563	564	567	571	573	573	575	568	86
Rhode Island	63	64	64	63	61	61	61	62	60	84
Connecticut	458	475	475	476	473	480	481	479	479	88
New York	8, 066	8, 091	8, 073	8, 128	8, 081	7, 868	7, 841	7, 621	7, 657	91
New Jersey	889	882	904	902	898	720	708	686	684	86
Pennsylvania	7, 807	7, 819	7, 973	7, 781	7, 688	7, 186	7, 314	7, 150	7, 120	97
Ohio	11, 794	11, 453	11, 350	11, 557	11, 374	10, 541	10, 751	10, 651	10, 401	97
Indiana	12, 046	11, 474	11, 491	11, 473	11, 371	10, 694	10, 878	10, 641	10, 255	96
Illinois	20, 529	20, 069	20, 256	20, 171	20, 291	19, 721	20, 131	19, 774	19, 166	97
Michigan	8, 932	8, 637	8, 604	9, 030	8, 899	8, 344	8, 322	8, 255	8, 285	93
Wisconsin	9, 412	9, 530	9, 644	9, 679	9, 638	9, 452	9, 534	9, 502	9, 508	90
Minnesota	16, 453	15, 713	16, 665	16, 963	17, 243	17, 899	17, 923	17, 868	17, 868	96
Iowa	21, 008	20, 755	21, 058	21, 069	21, 132	21, 177	21, 496	21, 574	21, 447	97
Missouri	15, 416	15, 194	15, 034	14, 568	14, 725	13, 970	14, 488	13, 997	13, 374	96
North Dakota	19, 160	18, 130	18, 537	19, 184	19, 775	20, 192	20, 452	19, 453	19, 740	96
South Dakota	15, 032	14, 918	15, 516	15, 596	15, 498	15, 762	15, 918	13, 629	16, 263	98
Nebraska	19, 020	18, 041	18, 263	18, 234	18, 367	19, 649	19, 674	19, 486	20, 306	97
Kansas	22, 074	21, 373	21, 076	21, 154	20, 503	21, 560	21, 238	21, 573	22, 085	93
Delaware	412	402	408	419	412	341	344	346	330	80
Maryland	1, 860	1, 832	1, 803	1, 805	1, 806	1, 618	1, 637	1, 640	1, 654	91
Virginia	4, 605	4, 535	4, 467	4, 578	4, 616	4, 036	4, 208	4, 232	4, 238	93
West Virginia	1, 883	1, 885	1, 888	1, 927	1, 908	1, 633	1, 794	1, 744	1, 773	95
North Carolina	6, 459	6, 477	6. 240	6, 799	6, 989	6, 668	6, 821	6, 900	6, 933	94
South Carolina	5, 636	5, 821	5, 692	5, 278	5, 288	5, 011	5, 076	4, 982	5, 104	92
Georgia	11, 074	10, 855	10, 499	9, 580	9, 304	8, 737	9, 009	9, 318	9, 261	94
Florida	1, 197	1, 162	1, 147	1, 198	1, 273	890	876	851	860	80
Kentucky	6, 402	5, 942	5, 706	5, 868	5, 990	5, 227	5, 354	5, 323	5, 205	95
Tennessee	6, 744	6, 673	6, 458	6, 657	6, 514	6, 261	6, 388	6, 726	6, 265	91
Alabama	7, 968	7, 989	7, 964	7, 885	7, 635	7, 091	7, 287	7, 360	7, 264	93
Mississippi	6, 450	6, 438	6, 564	6, 642	6, 267	5, 777	6, 046	6, 232	5, 927	96
Arkansas	6, 590	6, 782	6, 392	6, 364	6, 274	6, 473	6, 994	7, 073	6, 248	93
Louisiana	3, 970	4, 135	3, 856	3, 820	3, 914	3, 711	3, 943	4, 014	3, 687	91
Oklahoma	14, 438	13, 738	13, 849	14, 268	14, 616	14, 207	14, 518	15, 900	14, 586	93
Texas	23, 290	23, 824	24, 324	23, 778	25, 464	26, 803	25, 599	30, 442	29, 657	92
Montana	6, 501	5, 831	5, 567	6, 672	6, 545	6, 501	6, 662	6, 772	7, 530	87
Idaho	2, 713	2, 675	2, 691	2, 703	2, 706	2, 472	2, 579	2, 616	2, 824	91
Wyoming	1, 164	1, 347	1, 442	1, 552	1, 606	1, 562	1, 638	1, 670	1, 760	90
Colorado	4, 876	5, 196	5, 332	5, 270	5, 779	5, 526	5, 412	5, 934	6, 083	85
New Mexico	990	1, 066	1, 089	839	986	1, 166	841	1, 287	976	78
Arizona	431	495	430	454	478	475	470	519	551	85
Utah	927	993	1, 018	1, 078	1, 073	911	992	987	1, 012	88
Nevada	388	380	391	395	395	361	421	402	406	98
Washington	3, 936	3, 897	4, 026	3, 929	3, 923	3, 198	3, 486	3, 475	3, 536	86
Oregon	2, 771	2, 785	2, 812	2, 800	2, 843	2, 428	2, 674	2, 702	2, 758	80
California	5, 661	5, 555	5, 078	5, 264	5, 037	3, 966	4, 467	4, 587	4, 610	75
United States	351, 209	345, 089	345, 893	347, 616	349, 428	342, 155	346, 575	350, 334	349, 554	93. 8

Bureau of Agricultural Economics. Estimates based upon returns from crop reporters.

[1] Based on census proportions in 1919.

TABLE 473.—*Farm returns, 1926, with comparisons*

AVERAGES OF REPORTS OF OWNER-OPERATORS FOR THEIR OWN FARMS FOR THE CALENDAR YEAR

	United States					North Atlantic		East North Central		West North Central		South Atlantic		South Central		Western	
	1922	1923	1924	1925	1926	1925	1926	1925	1926	1925	1926	1925	1926	1925	1926	1925	1926
Number of reports	6,094	16,183	15,103	15,330	13,475	1,789	1,436	3,067	2,591	3,402	2,969	1,913	1,764	3,434	3,269	1,725	1,446
Size of farm—acres	252	298	303	304	315	144	138	153	152	354	353	206	203	374	421	606	599
Value of farm real estate, Jan. 1	$13,586	$14,530	$14,323	$14,157	$13,379	$9,115	$9,385	$14,260	$13,827	$21,137	$19,879	$9,543	$9,252	$10,324	$9,904	$18,184	$16,091
Value of farm personalty, Jan. 1	2,844	2,960	2,937	2,965	2,929	3,056	3,203	2,773	2,846	4,041	4,188	1,655	1,634	2,044	1,949	4,376	4,012
Receipts:																	
Crop sales	816	850	1,012	993	926	989	1,020	653	614	823	735	933	939	1,049	975	1,890	1,654
Sales of livestock	660	760	780	897	894	382	418	983	953	1,767	1,775	352	363	436	488	1,089	1,020
Sales of livestock products	454	550	570	585	589	1,375	1,442	770	770	509	516	300	291	211	253	646	690
Miscellaneous other	42	80	72	76	39	138	79	79	35	75	38	57	33	44	24	93	50
Total	1,972	2,240	2,434	2,551	2,448	2,884	2,959	2,485	2,372	3,174	3,064	1,642	1,626	1,740	1,740	3,718	3,414
Cash outlay:																	
Hired labor	331	350	384	386	386	477	514	279	292	347	328	327	386	308	338	775	653
Livestock bought	204	240	222	242	242	166	180	251	231	419	401	131	121	127	180	311	284
Feed bought	175	210	248	244	232	482	498	239	206	305	314	121	124	134	114	240	245
Fertilizer	57	60	66	69	73	145	131	54	50	7	10	207	234	53	62	19	17
Seed	43	40	44	47	48	61	70	49	52	48	53	34	39	36	34	63	52
Taxes on farm property	174	190	192	191	183	164	171	223	208	246	245	119	122	122	121	271	240
Machinery and tools	123	110	103	119	130	139	130	116	122	165	191	59	65	70	91	180	187
Miscellaneous other	150	150	151	179	179	195	210	169	176	195	201	88	95	111	110	390	361
Total	1,257	1,350	1,410	1,477	1,473	1,829	1,904	1,380	1,337	1,732	1,743	1,086	1,186	961	1,050	2,249	2,039
Receipts less cash outlay	715	890	1,024	1,074	975	1,055	1,055	1,105	1,035	1,442	1,321	556	440	779	690	1,469	1,375
Increase in inventory of personal property	202	130	181	223	158	297	111	265	134	238	4	60	129	45	283	578	319
Net result	917	1,020	1,205	1,297	1,133	1,352	1,166	1,370	1,169	1,680	1,325	616	569	824	973	2,047	1,694
Interest paid	(1)	230	230	225	215	95	111	198	179	387	371	99	101	156	157	362	340
Spent for farm improvements	(1)	140	133	131	128	135	159	116	129	160	154	103	96	104	99	177	148
NONCASH (ESTIMATED) ITEMS																	
Value of food produced and used on the farm [2]	$294	$265	$266	$274	$282	$284	$292	$281	$288	$278	$292	$306	$306	$253	$263	$249	$251
Value of family labor, including owner [2]	716	870	789	793	779	943	944	868	873	948	950	501	492	534	523	994	977
Change in value of real estate during year (—shows decrease)	−52	−66	+145	+173	+2	+133	+140	+72	+14	+133	−92	+448	−73	+103	−44	+304	+227

Bureau of Agricultural Economics. Computed from reports of individual farms operated by their owners. Tables for 1922 in Agriculture Yearbook, 1924, pp. 1131–1132. Tables for 1923–24 in Agriculture Yearbook, 1925, pp. 1342–1343.

[1] Not reported for 1922.

[2] Averages of farms for which the item was reported.

TABLE 476.—*Proportions of farmers obtaining net results within specified ranges*

	United States					North Atlantic		East North Central		West North Central		South Atlantic		South Central		Western	
	1922	1923	1924	1925	1926	1925	1926	1925	1926	1925	1926	1925	1926	1925	1926	1925	1926
Number of reports	6,094	16,183	15,103	15,330	13,475	1,789	1,436	3,067	2,591	3,402	2,969	1,913	1,764	3,434	3,269	1,725	1,446
Size of farm, acres	252	298	303	304	315	144	138	153	152	354	353	206	203	374	421	606	599
Value of farm property Jan. 1, per farm	$16,430	$17,490	$17,260	$17,122	$16,308	$12,171	$12,588	$17,033	$16,673	$25,178	$24,007	$11,198	$10,886	$12,368	$11,853	$22,560	$20,103
Net result per farm	917	1,020	1,205	1,297	1,133	1,352	1,166	1,370	1,169	1,680	1,325	616	569	824	973	2,047	1,694
Proportion obtaining—	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
$5,000 or more	1.77	1.88	2.69	3.00	2.29	2.69	2.16	1.63	1.12	4.64	3.13	0.89	0.51	1.78	1.65	7.31	6.43
$3,000 to $4,999	3.89	4.67	6.10	6.82	5.49	6.20	5.78	7.47	5.48	11.14	7.88	2.67	2.15	2.85	3.82	10.32	8.09
$2,500 to $2,999	2.51	2.88	3.61	4.03	3.59	4.42	3.48	5.02	4.32	5.82	5.09	1.57	1.98	1.98	2.26	5.16	4.29
$2,00 to $2,499	4.33	5.13	5.99	6.26	5.46	6.48	6.69	7.99	7.45	8.64	7.41	2.09	2.44	3.67	2.78	8.00	6.43
$1,500 to $1,999	7.78	8.91	9.30	9.92	9.05	11.68	9.61	13.07	11.38	11.79	11.01	5.54	4.42	6.00	7.13	11.42	10.30
$1,000 to $1,499	14.39	14.49	15.13	15.44	14.09	17.16	15.53	18.03	17.02	17.99	14.96	9.36	9.18	13.34	12.02	14.95	16.25
$500 to $999	22.82	23.07	21.86	21.79	22.10	24.15	21.87	24.06	23.74	19.17	19.43	21.06	20.07	23.79	25.06	17.27	20.68
$0 to $499	27.98	26.09	24.68	22.32	26.43	20.07	24.30	18.26	22.35	13.41	16.94	35.28	39.63	31.33	36.34	17.16	16.80
$0 to −$499	9.89	9.10	7.85	7.81	8.56	5.81	8.29	4.04	5.48	5.17	8.76	17.30	15.36	10.48	7.68	5.91	7.68
−$500 to −$999	2.36	2.07	1.57	1.54	1.69	0.89	1.53	0.33	1.08	1.29	2.63	2.98	2.44	2.56	0.89	1.29	1.87
−$1,000 or more	2.28	1.71	1.22	1.07	1.25	0.45	0.76	0.10	0.58	0.94	2.76	1.26	1.82	2.22	0.37	1.21	1.18
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Bureau of Agricultural Economics. See table 475.

State	Number of reports	Average acreage in wheat per farm	Average yield per acre	Gross cost per acre to— Prepare and plant	Harvest and thresh	Market	Miscellaneous labor [1]	Commercial fertilizer	Manure	Seed	Land rent	Miscellaneous costs [2]	Total	Credit per acre (straw)	Net cost Per acre	Per bushel
		Acres	Bushels	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars	Dollars
New York	89	10	22	7.60	6.24	1.90	0.24	3.42	2.95	3.29	6.85	4.21	36.70	4.93	31.77	1.44
New Jersey	16	16	28	5.87	9.85	1.28	.29	4.69	2.81	3.19	5.86	5.53	39.37	7.44	31.93	1.14
Pennsylvania	148	16	23	5.94	6.40	1.61	.18	3.21	3.76	2.91	6.09	3.62	33.72	6.19	27.53	1.20
Delaware	23	31	24	5.69	5.92	1.24	.75	4.29	.15	2.46	4.72	3.18	28.40	3.74	24.66	1.03
Maryland	24	29	27	5.19	7.14	1.63	.26	3.95	1.60	2.42	5.95	3.63	31.77	3.43	28.34	1.05
Virginia	115	18	20	4.83	4.94	1.62	.21	3.11	1.34	2.18	6.00	2.54	26.77	3.27	23.50	1.18
West Virginia	30	13	20	4.99	4.71	2.69	.49	3.46	1.97	2.82	6.10	2.14	29.37	2.53	26.84	1.34
North Carolina	32	13	17	4.78	4.83	1.63	.03	3.09	1.12	1.90	7.68	2.36	27.42	2.35	25.07	1.47
South Carolina	15	9	16	2.30	5.09	1.99	.11	4.19	.47	2.09	7.20	2.35	25.79	.53	25.26	1.58
Georgia	38	8	17	2.62	4.83	1.21	.24	2.12	1.72	1.75	4.42	2.88	21.79	1.36	20.43	1.20
Ohio	239	19	26	4.78	5.42	1.32	.07	2.77	1.02	2.74	6.55	2.64	27.31	2.59	24.72	.95
Indiana	287	23	22	3.97	4.37	1.25	.14	2.29	1.17	2.32	6.61	2.46	24.58	1.69	22.89	1.04
Illinois	183	34	21	3.51	4.27	1.10	.17	.69	.78	2.08	6.86	2.36	21.82	.88	20.94	1.00
Michigan	213	14	22	5.67	4.83	1.44	.10	2.07	2.25	2.45	5.56	2.66	27.03	2.78	24.25	1.10
Wisconsin	47	7	24	4.47	5.54	2.00	.12	.13	2.09	2.69	7.69	3.00	27.73	2.94	24.79	1.03
Minnesota	151	29	15	3.45	3.69	.96	.23	.02	.70	2.19	5.03	2.51	18.78	.57	18.21	1.21
Iowa	53	21	21	2.59	4.10	1.06	.11	.23	.81	2.12	8.30	2.17	21.49	1.12	20.37	.97
Missouri	180	32	17	3.71	4.21	1.29	.15	1.18	.65	1.78	4.88	2.13	19.98	1.10	18.88	1.11
North Dakota	228	178	10	3.41	2.95	.60	.15	------	.23	1.82	2.65	1.89	13.70	.24	13.46	1.35
South Dakota	99	74	7	2.37	2.36	.78	.14	------	.17	1.85	3.13	1.80	12.60	.55	12.05	1.72
Nebraska	131	70	15	3.08	3.86	.81	.08	.08	.42	1.60	5.07	2.34	17.34	.39	16.95	1.13
Kansas	493	142	16	3.21	4.20	.82	.10	.11	.31	1.54	4.22	1.89	16.40	.34	16.06	1.00
Kentucky	41	28	22	3.52	5.51	1.49	.09	1.38	.50	2.15	6.86	2.22	23.72	2.15	21.57	.98
Tennessee	37	18	16	3.92	4.25	1.60	.11	1.64	.86	1.87	6.28	2.33	22.86	1.18	21.68	1.36
Texas	67	68	19	2.93	4.52	1.34	.17	.12	.16	1.34	4.55	2.49	17.62	.69	16.93	.89
Oklahoma	102	117	19	3.25	4.99	1.05	.09	.03	.33	1.35	4.22	2.33	17.64	.46	17.18	.90
Arkansas	9	17	16	2.94	3.89	1.62	.08	1.84	1.44	1.52	3.71	2.08	19.12	1.01	18.11	1.13
Montana	142	177	13	4.48	3.54	1.25	.61	------	.35	1.23	3.27	2.36	17.19	.46	16.73	1.29
Colorado	94	105	23	4.04	5.42	1.73	1.76	.01	.92	1.56	6.14	2.88	24.46	.61	23.85	1.04
New Mexico	15	50	25	4.47	5.34	1.85	3.14	------	.59	1.30	5.21	3.56	25.46	.79	24.67	.99
Utah	23	32	33	6.35	8.25	2.32	2.94	------	2.43	1.97	16.00	3.78	44.04	1.61	42.43	1.29
Idaho	48	83	27	4.65	5.47	1.36	2.66	.11	.73	2.02	11.37	3.15	31.52	.44	31.08	1.15
Washington	60	238	20	4.61	4.67	.94	.34	------	.52	1.67	9.47	2.92	25.14	.84	24.30	1.22
Oregon	40	97	21	4.36	4.79	1.17	.55	------	.60	2.11	10.51	3.14	27.23	.59	26.64	1.27
Total [3]	3,545	71	19	4.07	4.55	1.18	.28	1.15	.99	2.04	6.12	2.48	22.86	1.53	21.33	1.12

Bureau of Agricultural Economics. From returns to mail inquiry sent to crop reporters.
Figures for 1923, 1924, and 1925, see Agriculture Yearbooks, 1924, p. 1134; 1925, p. 1326; and 1926, p. 1209.

[1] Includes miscellaneous labor, irrigating and water, seed treatment, and material.
[2] Sacks and twine, crop insurance, use of implements, use of storage buildings, and overhead.
[3] The total includes 33 reports from the following States in which there were not enough reports to show State averages: Maine, New Hampshire, Alabama, Wyoming, Arizona, Nevada, and California.

TABLE 478.—*Wheat: Cost of production, by yield groups, 1926*

Yield group (bushels per acre)	Number of reports	Average acreage in wheat per farm	Average yield per acre	Gross cost per acre to—									Credit per acre (straw)	Net cost	
				Prepare and plant	Harvest and thresh	Market	Miscellaneous labor [1]	Fertilizer and manure	Seed	Land rent	Miscellaneous costs [2]	Total		Per acre	Per bushel
		Acres	*Bushels*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
Winter-wheat belt: [3]															
6 and under	107	154	3	2.55	2.01	0.44	0.07	0.33	1.44	3.12	1.35	11.31	0.47	10.84	3.61
7 to 12	189	104	10	3.05	3.61	.68	.10	.57	1.51	3.85	1.78	15.15	.47	14.68	1.47
13 to 18	256	111	16	3.43	4.43	.88	.12	.61	1.58	4.38	2.19	17.62	.43	17.19	1.07
19 to 24	223	92	21	3.54	4.74	1.15	.13	.87	1.63	4.91	2.22	19.19	.65	18.54	.88
25 and over	131	97	28	3.55	5.54	1.21	.13	1.10	1.70	5.69	2.41	21.33	.52	20.81	.74
Average all reports	906	108	16	3.29	4.23	.91	.11	.71	1.58	4.51	2.05	17.39	.51	16.88	1.06
Spring-wheat belt: [4]															
6 and under	143	141	3	2.95	1.92	.39	.13	.12	1.68	2.54	1.53	11.26	.31	10.95	3.65
7 to 12	163	132	10	3.40	2.95	.68	.19	.21	1.82	3.42	2.24	14.91	.27	14.64	1.46
13 to 18	88	136	15	3.49	3.75	.82	.20	.45	1.93	3.36	1.94	15.94	.32	15.62	1.04
19 and over	27	120	22	4.07	5.50	.97	.43	.51	2.18	5.29	3.17	22.12	.58	21.54	.98
Average all reports	421	135	10	3.32	2.93	.65	.19	.25	1.82	3.17	2.01	14.34	.31	14.03	1.40

Bureau of Agricultural Economics. From returns to mail inquiry sent to crop reporters. Figures for 1923, 1924, and 1925, see Agriculture Yearbooks, 1924, p. 1133; 1925, p. 1328; and 1926, p. 1210.

[1] Includes miscellaneous labor, irrigating and water, seed treatment, and material.
[2] Includes sacks and twine, crop insurance, use of implements, use of storage buildings, and overhead.
[3] Winter-wheat belt as used here includes Kansas, Nebraska, Missouri, and Oklahoma.
[4] Spring-wheat belt as used here includes western Minnesota, North Dakota, eastern South Dakota, and eastern Montana.

TABLE 479.—*Wheat: Comparative production costs and yields, by States, 1923, 1924, 1925, and 1926*

State	Averages for farms reporting: Net cost per bushel				Net cost per acre				Yield per acre				Average yields per acre[1]				Average, 1921–1925
	1923	1924	1925	1926	1923	1924	1925	1926	1923	1924	1925	1926	1923	1924	1925	1926	
	Dollars	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*
New York	1.21	1.27	1.36	1.44	30.26	27.93	32.75	31.77	25	22	24	22	20	19	20	18	19
New Jersey	1.22	1.43	1.11	1.14	29.22	31.52	27.79	31.93	24	22	25	28	20	18	21	22	20
Pennsylvania	1.24	1.41	1.36	1.20	27.26	28.23	29.81	27.53	22	20	22	23	19	16	20	20	18
Maryland	1.28	1.42	1.21	1.05	25.53	26.93	27.91	28.34	20	19	23	27	19	16	21	23	17
Virginia	1.50	1.62	1.54	1.18	22.46	24.23	26.26	23.50	15	15	17	20	13	13	14	16	13
West Virginia	1.57	1.58	1.44	1.34	23.60	25.28	25.90	26.84	15	16	18	20	13	13	14	16	13
North Carolina	1.79	1.82	1.89	1.47	23.32	23.65	24.56	25.07	13	13	13	17	11	12	11	14	10
South Carolina	1.67	1.74	1.82	1.58	21.68	20.91	21.83	25.26	13	12	12	16	11	11	11	16	10
Georgia	1.92	1.71	1.65	1.20	19.22	18.76	21.41	20.43	10	11	13	17	9	10	10	15	10
Ohio	1.13	1.18	1.37	.95	23.74	24.74	24.63	24.72	21	21	18	26	18	18	15	22	16
Indiana	1.10	1.16	1.35	1.04	21.96	22.03	21.54	22.89	20	19	16	22	16	17	14	20	15
Illinois	.96	1.13	1.16	1.00	19.16	20.30	20.84	20.94	20	18	18	21	18	16	16	18	17
Michigan	1.18	1.01	1.25	1.10	23.66	26.22	26.28	24.25	20	26	21	22	17	24	17	18	18
Wisconsin	1.23	1.00	1.14	1.03	20.86	23.07	23.84	24.79	17	23	21	24	17	24	20	20	18
Minnesota	1.19	.88	1.16	1.21	17.85	19.42	18.61	18.21	15	22	16	15	13	22	13	13	14
Iowa	1.03	.95	1.19	.97	19.65	20.97	22.55	20.37	19	22	19	21	18	20	16	21	19
Missouri	1.24	1.30	1.29	1.11	18.66	19.43	19.36	18.88	15	15	15	17	13	13	13	15	13
North Dakota	1.41	.90	1.08	1.35	12.66	14.37	15.05	13.46	9	16	14	10	7	16	12	8	12
South Dakota	1.13	.96	1.13	1.72	13.57	14.45	14.74	12.05	12	15	13	7	10	15	12	6	12
Nebraska	1.27	.90	1.19	1.13	16.55	18.96	16.67	16.95	13	21	14	15	10	19	13	13	14
Kansas	1.21	.99	1.40	1.00	15.69	16.79	15.37	16.06	13	17	11	16	10	16	9	15	12
Kentucky	1.37	1.65	1.50	.98	20.57	19.77	22.56	21.57	15	12	15	22	12	10	14	18	12
Tennessee	1.48	1.56	1.51	1.36	19.26	20.28	21.09	21.68	13	13	14	16	10	10	12	18	10
Texas	1.28	.88	1.56	.89	15.35	16.70	12.44	16.93	12	19	8	19	10	18	8	18	11
Oklahoma	1.13	.92	1.39	.90	13.53	15.58	13.90	17.18	12	17	10	19	11	16	8	18	11
Arkansas	1.61	1.09	1.65	1.13	19.31	14.11	19.83	18.11	12	13	12	16	11	12	13	14	12
Montana	1.09	1.05	1.15	1.29	17.48	16.73	16.16	16.73	16	16	14	13	15	16	11	12	14
Wyoming	.98	1.04	.87	----	17.59	17.73	20.11	----	18	17	23	----	16	15	18	19	16
Colorado	1.07	1.01	1.23	1.04	22.57	21.31	22.19	23.85	21	21	18	23	13	14	13	13	13
New Mexico	.97	1.28	----	.99	16.45	20.53	----	24.67	17	16	----	25	12	14	6	23	11
Utah	1.19	1.52	1.25	1.29	38.10	42.48	41.18	42.43	32	28	33	33	24	16	26	23	22
Idaho	1.04	1.24	1.00	1.15	29.12	28.46	32.14	31.08	28	23	32	27	29	19	28	24	24
Washington	.97	1.38	1.23	1.22	27.06	26.17	29.45	24.30	28	19	24	20	25	14	19	19	19
Oregon	1.12	1.26	1.26	1.27	26.94	26.54	26.46	26.64	24	21	21	21	24	16	20	19	20

Bureau of Agricultural Economics. From returns to mail inquiry sent to crop reporters.

[1] State average yields obtained by the Division of Crop and Livestock Estimates and published in the Agricultural Yearbooks, carried to nearest whole number.

TABLE 480.—*Corn: Cost of production, by States, 1926*

State	Number of reports	Average acreage in corn per farm	Average yield per acre	Gross cost per acre to— Prepare and plant	Cultivate	Harvest	Market	Miscellaneous labor [1]	Commercial fertilizer	Manure	Seed	Land rent	Miscellaneous costs [2]	Total	Credit per acre (stover and fodder)	Net cost Per acre	Net cost Per bushel
		Acres	*Bushels*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
New York	102	6	44	8.90	5.74	8.68	3.91	0.18	3.41	8.74	0.98	7.26	4.18	51.98	6.91	45.07	1.02
New Jersey	22	16	57	7.40	4.92	13.80	2.38	.20	6.55	8.34	.44	6.56	7.36	57.95	6.96	50.99	.89
Pennsylvania	157	13	46	6.27	3.80	7.57	2.66	.06	2.60	6.55	.56	6.14	3.32	39.53	6.63	32.90	.72
Delaware	21	25	36	5.29	3.78	7.60	1.69	.10	1.97	7.69	.39	4.82	2.61	35.94	5.49	30.45	.85
Maryland	28	18	46	5.73	2.66	7.80	2.46	.06	2.30	4.75	.41	6.33	2.43	34.93	5.26	29.67	.64
Virginia	128	17	38	5.76	3.89	5.34	2.11	.13	2.11	3.11	.49	7.01	2.40	32.35	5.23	27.12	.71
West Virginia	59	12	40	6.83	4.93	5.57	3.16	.17	2.63	2.70	.47	7.11	1.94	35.51	3.78	31.73	.79
North Carolina	63	20	30	5.39	4.35	2.98	2.54	.13	4.15	2.00	.46	8.65	2.43	33.08	3.15	29.93	1.00
South Carolina	54	40	19	3.56	3.96	1.84	2.12	.01	4.76	.35	.38	5.77	2.41	25.16	1.61	23.55	1.24
Georgia	109	41	19	3.29	2.92	1.57	1.48	.08	2.48	.66	.37	4.57	2.41	19.83	1.58	18.25	.96
Florida	10	26	28	4.77	5.14	2.39	1.94	-----	4.19	.25	.44	5.00	1.65	25.77	2.40	23.37	.83
Ohio	278	25	49	5.65	3.43	7.04	2.20	.03	1.41	4.15	.41	6.82	2.45	33.59	3.40	30.19	.62
Indiana	382	41	45	4.25	2.72	3.73	1.96	.06	.93	2.26	.41	6.76	2.27	25.35	1.31	24.04	.53
Illinois	327	67	41	3.87	2.63	3.22	1.72	.04	.44	1.50	.55	6.95	2.01	22.93	.83	22.10	.54
Michigan	267	13	40	5.95	3.54	6.22	2.63	.06	.73	5.01	.61	5.49	2.80	33.04	4.72	28.32	.71
Wisconsin	140	18	40	4.68	3.66	4.97	3.11	.04	.37	5.52	.85	6.76	3.20	33.16	4.05	29.11	.73
Minnesota	208	35	38	4.09	3.25	3.68	1.80	.05	.01	3.19	.78	5.29	2.48	24.62	1.78	22.84	.60
Iowa	338	79	45	3.73	2.77	3.46	2.05	.07	.08	1.93	.67	9.12	2.43	26.31	.91	25.40	.56
Missouri	380	43	31	3.78	2.88	2.58	2.04	.09	.28	1.12	.41	5.42	1.91	20.51	1.14	19.37	.62
North Dakota	116	39	15	3.56	2.54	2.03	1.12	.03	-----	1.45	.80	2.37	1.87	15.77	2.85	12.92	.86
South Dakota	148	89	20	3.45	2.01	2.46	1.65	.05	.02	1.06	.47	3.79	1.51	16.47	1.22	15.25	.76
Nebraska	214	96	19	2.68	1.89	1.81	1.36	.10	.01	.84	.32	4.98	1.70	15.69	.61	15.08	.79
Kansas	433	59	15	2.44	2.02	1.62	1.15	.06	.03	.83	.27	4.26	1.29	13.97	.76	13.21	.88
Kentucky	109	26	36	4.59	3.20	3.57	2.39	.05	.93	1.10	.41	7.57	2.51	26.32	1.80	24.52	.68
Tennessee	90	35	30	4.47	3.50	2.44	2.61	.04	1.11	2.09	.41	6.79	2.33	25.79	1.48	24.31	.81
Alabama	115	40	22	4.20	4.02	2.14	2.31	.08	2.36	.67	.40	4.58	2.37	23.13	.88	22.25	1.01
Mississippi	67	39	25	4.65	5.00	2.23	1.90	.10	2.16	.93	.46	5.91	2.73	26 07	.59	25.48	1.02
Louisiana	32	52	24	4.26	4.27	2.03	1.94	.18	2.72	.58	.67	4.95	2.15	23.75	.33	23.42	.98
Texas	284	24	29	3.53	2.67	1.82	2.15	.13	.47	.38	.45	5.14	1.94	18.68	.68	18.00	.62
Oklahoma	97	36	27	2.86	2.84	1.94	1.78	.04	.01	.42	.33	3.95	1.26	15.43	.38	15.05	.56
Arkansas	101	28	23	3.87	4.06	1.79	2.09	.28	.94	1.04	.36	5.64	1.93	22.00	.88	21.12	.92
Montana	50	26	11	4.43	2.16	2.21	1.13	.35	-----	.96	.63	2.27	1.13	15.27	2.85	12.42	1.13
Wyoming	12	34	17	3.72	1.49	2.87	2.08	.12	-----	.44	.53	2.79	1.19	15.23	2.10	13.13	.77
Colorado	92	60	21	3.48	1.89	2.32	2.07	1.42	.01	1.25	.36	4.67	1.56	19.03	1.29	17.74	.84
New Mexico	27	39	23	3.68	1.89	2.24	2.32	2 25	.07	.89	.35	6.59	2.62	22.90	1.40	21.50	.93
Total [3]	5,120	42	33	4.33	3.07	3.68	1.99	.13	.94	2.38	.50	5.95	2.23	25.20	2.10	23.10	.70

Bureau of Agricultural Economics. From returns to mail inquiry sent to crop reporters.
Figures for 1923, 1924, and 1925, see Agricultural Yearbooks, 1924, p. 1136; 1925, p. 1330; and 1926, p. 1212.

[1] Includes miscellaneous labor, irrigating, and water.
[2] Sacks and twine, crop insurance, use of implements, use of storage buildings, and overhead.
[3] The total includes 60 records from the following States in which there were not enough reports to show State averages: Maine, New Hampshire, Vermont, Massachuestts, Rhode Island, Connecticut, Utah, Idaho, Washington, and Oregon.

TABLE 481.—*Corn: Cost of production, by yield groups, 1926*

Yield group (bushels per acre)	Number of reports	Average acreage in corn per farm	Average yield per acre	Gross cost per acre to— Prepare and plant	Cultivate	Harvest	Market	Miscellaneous labor [1]	Fertilizer and manure	Seed	Land rent	Miscellaneous costs [2]	Total	Credit per acre (stover and fodder)	Net cost Per acre	Net cost Per bushel
		Acres	*Bushels*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
All States:																
7 and under	341	71	2	2.72	1.91	1.03	0.72	0.06	0.89	0.38	3.09	1.32	12.12	1.56	10.56	5.28
8 to 17	362	47	13	3.48	2.58	2.00	1.13	.08	1.84	.38	3.78	1.70	16.97	1.18	15.79	1.21
18 to 27	1,068	37	22	3.89	2.95	2.44	1.67	.08	2.31	.45	4.77	1.85	20.41	1.53	18.88	.86
28 to 37	1,027	36	32	4.33	3.15	3.44	2.11	.14	2.92	.49	5.89	2.20	24.67	1.95	22.72	.71
38 to 47	994	44	41	4.70	3.27	4.51	2.22	.15	3.75	.54	6.85	2.35	28.34	2.41	25.93	.63
48 to 57	702	43	51	5.00	3.39	5.39	2.35	.14	5.02	.60	7.75	2.71	32.35	2.77	29.58	.58
58 and over	426	32	67	5.60	3.78	6.61	2.53	.27	7.03	.58	8.50	3.42	38.32	3.71	34.61	.52
United States	5,120	42	33	4.33	3.07	3.68	1.99	.13	3.32	.50	5.95	2.23	25.20	2.10	23.10	.70
Corn Belt: [3]																
17 and under	112	67	10	3.41	2.19	1.63	.85	.07	1.06	.35	4.73	1.62	15.91	.98	14.93	1.49
18 to 27	229	52	23	3.36	2.36	2.24	1.44	.04	1.28	.37	4.99	1.74	17.82	.86	16.96	.74
28 to 37	370	53	32	3.68	2.52	2.98	1.83	.08	1.97	.44	6.11	1.93	21.54	1.08	20.46	.64
38 to 47	484	65	41	4.05	2.78	3.44	1.99	.05	2.25	.51	7.24	2.05	24.36	1.19	23.17	.57
48 to 57	364	64	51	4.10	2.74	4.06	1.97	.05	2.60	.54	8.52	2.42	27.00	1.10	25.90	.51
58 and over	175	47	63	4.47	3.07	5.03	2.36	.11	3.98	.57	9.04	2.90	31.53	1.74	29.79	.47
Average all reports	1,734	59	39	3.89	2.65	3.37	1.85	.06	2.24	.48	6.99	2.11	23.64	1.15	22.49	.58

Bureau of Agricultural Economics. From returns to mail inquiry sent to crop reporters.
Figures for 1923, 1924, and 1925, see Agriculture Yearbooks 1924, p. 1135; 1925, p. 1332; and 1926, p. 1213.

[1] Includes miscellaneous labor, irrigating, and water.
[2] Includes sacks and twine, crop insurance, use of implements, use of storage buildings, and overhead.
[3] Corn Belt as used here includes Indiana, Illinois, Iowa, western Ohio, southeast corner of South Dakota, eastern Nebraska, northeast corner of Kansas, and the northern three-fourths of Missouri.

TABLE 482.—*Corn: Comparative production costs and yields, by States, 1923, 1924, 1925, and 1926*

State	Averages for farms reporting												Average yields per acre [1]				
	Net cost per bushel				Net cost per acre				Yield per acre								
	1923	1924	1925	1926	1923	1924	1925	1926	1923	1924	1925	1926	1923	1924	1925	1926	Average, 1921–1925
	Dollars	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*
New York	0.91	0.95	0.95	1.02	35.43	38.18	41.64	45.07	39	40	44	44	32	34	36	35	37
New Jersey	.79	1.07	.87	.89	41.31	44.01	48.66	50.99	52	41	56	57	40	34	52	46	43
Pennsylvania	.78	.91	.71	.72	38.03	35.39	38.24	32.90	49	39	54	46	40	36	51	41	44
Delaware	.73	.95	.82	.85	31.51	32.19	40.87	30.45	43	34	50	36	33	27	37	31	33
Maryland	.68	.80	.61	.64	31.80	32.98	32.08	29.67	47	41	53	46	39	31	45	40	39
Virginia	.69	.83	.83	.71	27.01	27.53	29.20	27.12	39	33	35	38	29	21	22	28	25
West Virginia	.79	.91	.80	.79	33.28	30.91	35.78	31.73	42	34	45	40	34	26	36	33	33
North Carolina	.95	1.18	1.08	1.00	29.52	29.52	29.27	29.93	31	25	27	30	22	18	18	22	20
South Carolina	1.01	1.17	1.56	1.24	23.22	24.58	25.00	23.55	23	21	16	19	16	12	12	16	14
Georgia	1.05	1.02	1.39	.96	18.88	18.45	20.86	18.25	18	18	15	19	12	12	11	14	12
Florida	1.12	1.04	.99	.83	21.37	25.00	19.86	23.37	19	24	20	28	12	14	15	14	14
Ohio	.64	.84	.57	.62	31.45	30.33	30.74	30.19	49	36	54	49	41	26	48	40	39
Indiana	.55	.74	.49	.53	24.57	24.35	24.10	24.04	45	33	49	45	38	26	44	36	36
Illinois	.52	.58	.51	.54	21.38	21.88	23.29	22.10	41	38	46	41	38	33	42	34	36
Michigan	.74	.90	.68	.71	28.99	27.12	30.00	28.32	39	30	44	40	34	28	40	34	36
Wisconsin	.71	1.04	.62	.73	29.03	27.04	29.85	29.11	41	26	48	40	37	26	46	34	40
Minnesota	.57	.78	.62	.60	22.18	22.49	23.55	22.84	39	29	38	38	36	27	36	34	35
Iowa	.52	.75	.55	.56	24.09	24.87	26.18	25.40	46	33	48	45	40	28	44	37	40
Missouri	.61	.68	.60	.62	20.21	20.51	20.40	19.37	33	30	34	31	30	24	30	27	28
North Dakota	.42	.73	.66	.86	13.40	11.70	14.44	12.92	32	16	22	15	34	22	24	18	27
South Dakota	.50	.71	.78	.76	17.54	16.36	16.36	15.25	35	23	21	20	34	21	18	18	27
Nebraska	.49	.68	.55	.79	17.10	17.06	16.62	15.08	35	25	30	19	33	22	26	16	27
Kansas	.53	.54	.59	.88	13.71	13.99	13.68	13.21	26	26	23	15	22	22	17	10	20
Kentucky	.80	.80	.76	.68	28.01	25.50	26.44	24.52	35	32	35	36	28	25	26	33	27
Tennessee	.77	.81	.87	.81	24.77	25.09	24.41	24.31	32	31	28	30	24	22	20	28	23
Alabama	.99	1.14	1.14	1.01	19.83	21.57	21.59	22.25	20	19	19	22	14	12	14	16	14
Mississippi	1.17	1.17	1.07	1.02	23.38	22.29	24.70	25.48	20	19	23	25	14	12	18	19	16
Louisiana	1.15	1.35	1.25	.98	21.86	24.32	25.09	23.42	19	18	20	24	15	12	18	18	16
Texas	.81	.86	1.95	.62	17.76	18.02	17.51	18.00	22	21	9	29	18	16	8	28	18
Oklahoma	.86	.70	.99	.56	13.71	14.79	13.84	15.05	16	21	14	27	12	19	8	26	16
Arkansas	1.06	.93	.95	.92	22.30	20.43	20.89	21.12	21	22	22	23	16	16	14	20	17
Montana	.65	.90	.83	1.13	15.49	13.45	11.65	12.42	24	15	14	11	26	18	16	11	21
Wyoming	.49	.85	.83	.77	14.15	14.38	20.84	13.13	29	17	25	17	27	12	23	20	22
Colorado	.57	.86	.69	.84	15.83	15.50	15.28	17.74	28	18	22	21	25	10	15	7	16
New Mexico	.85	.78	.80	.93	18.61	12.43	13.65	21.50	22	16	17	23	16	18	18	20	18

Bureau of Agricultural Economics. From returns to mail inquiry sent to crop reporters.

[1] State average yields obtained by the Division of Crop and Livestock Estimates and published in the Agricultural Yearbooks, carried to nearest whole number.

TABLE 483.—*Oats: Cost of production, by States, 1926*

State	Number of reports	Average acreage in oats per farm	Average yield per acre	Gross cost per acre to—										Credit per acre (straw)	Net cost	
				Prepare and plant	Harvest and thresh	Market	Miscellaneous labor [1]	Commercial fertilizer	Manure	Seed	Land rent	Miscellaneous costs [2]	Total		Per acre	Per bushel
		Acres	*Bushels*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
Maine	19	14	44	7.46	10.14	1.58	0.61	2.78	5.63	3.42	6.33	3.72	41.67	4.79	36.88	0.84
New York	194	12	41	7.28	7.04	2.47	.27	2.82	1.64	2.08	6.03	3.70	33.33	5.21	28.12	.69
New Jersey	11	14	39	5.57	8.86	1.07	.09	1.50	.18	1.52	4.50	4.63	27.92	6.23	21.69	.56
Pennsylvania	146	11	41	5.64	5.88	1.62	.15	2.40	1.04	1.72	5.24	3.25	26.94	4.80	22.14	.54
Maryland	11	8	36	4.61	4.77	1.30	.24	2.50	1.64	1.50	5.35	2.21	24.12	2.27	21.85	.61
Virginia	58	8	28	4.66	4.34	1.64	.12	2.18	1.84	1.57	5.52	2.60	24.47	3.10	21.37	.76
West Virginia	34	7	33	5.00	5.01	1.68	.36	2.34	1.08	1.58	6.44	1.48	24.97	2.45	22.52	.68
North Carolina	28	7	27	5.15	4.61	1.35	.02	1.91	.46	1.83	6.42	1.96	23.71	2.67	21.04	.78
South Carolina	37	23	30	2.47	5.66	1.66	.18	2.42	.27	1.87	6.10	2.21	22.84	1.63	21.21	.71
Georgia	59	18	29	2.47	4.29	1.17	.27	1.71	.35	1.61	4.13	2.18	18.18	1.28	16.90	.58
Ohio	228	16	48	3.94	5.22	1.42	.06	1.25	.31	1.25	6.40	2.56	22.41	2.36	20.05	.42
Indiana	281	25	38	2.46	3.91	1.15	.09	.41	.31	1.14	6.03	2.37	17.87	1.45	16.42	.43
Illinois	262	39	34	2.06	3.61	1.00	.18	.22	.30	1.24	6.55	2.04	17.20	1.29	15.91	.47
Michigan	273	13	39	5.03	5.15	1.54	.10	.94	.90	1.19	5.40	2.55	22.80	2.90	19.90	.51
Wisconsin	198	22	42	4.14	4.87	1.97	.17	.22	1.29	1.47	6.57	3.06	23.76	3.07	20.69	.49
Minnesota	250	32	37	3.36	3.99	1.23	.17	.03	.67	1.31	4.90	2.45	18.11	.96	17.15	.46
Iowa	314	44	39	1.74	3.78	1.16	.17	.03	.41	1.38	8.22	2.34	19.23	1.42	17.81	.46
Missouri	224	24	24	2.51	3.68	1.18	.15	.42	.28	1.24	4.11	1.73	15.30	1.19	14.11	.59
North Dakota	195	57	20	3.28	2.91	.71	.12	----	.13	.95	2.41	1.83	12.34	.50	11.84	.59
South Dakota	132	57	15	2.23	2.26	1.07	.12	----	.22	1.08	3.69	1.75	12.42	.63	11.79	.79
Nebraska	149	35	20	2.12	3.00	1.18	.06	.08	.40	1.13	5.26	2.04	15.27	.88	14.39	.72
Kansas	323	27	24	2.55	4.02	.93	.07	.04	.30	1.28	4.27	1.73	15.19	.71	14.48	.60
Tennessee	27	10	26	3.37	3.54	1.52	.34	.95	.34	1.32	5.48	2.05	18.91	.99	17.92	.69
Texas	157	32	49	2.66	5.67	1.85	.17	.03	.13	1.45	5.24	2.66	19.86	.97	18.89	.39
Oklahoma	90	29	34	2.99	4.71	1.21	.11	.02	.15	1.24	3.97	2.06	16.46	.59	15.87	.47
Montana	90	26	23	4.12	3.25	1.46	.68	----	.25	1.01	2.46	2.22	15.45	.98	14.47	.63
Colorado	58	31	40	4.20	6.32	2.46	2.18	----	1.21	1.52	5.70	3.43	27.02	1.32	25.70	.64
Utah	14	7	55	6.35	7.85	2.55	3.04	----	2.21	1.86	14.35	3.12	41.33	2.21	39.12	.71
Idaho	17	18	49	4.51	6.00	1.67	2.56	.14	----	1.45	8.36	3.47	28.16	.62	27.54	.56
Total [3]	4,045	27	34	3.42	4.42	1.33	.21	.61	.59	1.35	5.48	2.38	19.79	1.80	17.99	.53

Bureau of Agricultural Economics. From returns to mail inquiry sent to crop reporters.
Figures for 1923, 1924, and 1925, see Agriculture Yearbooks, 1924, p. 1138; 1925, p. 1334; and 1926, p. 1215.

[1] Includes miscellaneous labor, irrigating and water, seed treatment, and material.
[2] Sacks and twine, crop insurance, use of implements, use of storage buildings, and overhead.
[3] The total includes 166 records from the following States in which there were not enough reports to show State averages: New Hampshire, Vermont, Massachusetts, Connecticut, Delaware, Florida, Kentucky, Alabama, Mississippi, Louisiana, Arkansas, Wyoming, New Mexico, Washington, Oregon, and California.

TABLE 484.—*Oats: Comparative production costs and yields, by States, 1923, 1924, 1925, and 1926*

State	Averages for farms reporting												Average yields per acre [1]				Average, 1921–1925
	Net cost per bushel				Net cost per acre				Yield per acre								
	1923	1924	1925	1926	1923	1924	1925	1926	1923	1924	1925	1926	1923	1924	1925	1926	
	Dollars	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*	*Bushels*
Maine	0.82	0.95	0.69	0.84	39.20	39.73	37.12	36.88	48	42	54	44	37	38	45	38	39
New York	.63	.63	.62	.69	25.23	25.69	27.49	28.12	40	41	44	41	32	36	36	34	32
New Jersey	.65	.65	.59	.56	20.01	22.92	18.27	21.69	31	35	31	39	24	30	30	33	28
Pennsylvania	.65	.55	.58	.54	22.20	22.70	23.37	22.14	34	41	40	41	29	36	35	32	32
Maryland	.58	.62	.65	.61	20.38	22.28	22.64	21.85	35	36	35	36	30	34	32	33	31
Virginia	.70	.66	.79	.76	19.62	18.60	22.07	21.37	28	28	28	28	22	24	22	26	22
West Virginia	.83	.73	.69	.68	22.31	22.52	24.19	22.52	27	31	35	33	24	24	27	28	24
North Carolina	.79	.87	.81	.78	21.28	20.97	21.90	21.04	27	24	27	27	22	18	19	22	20
South Carolina	.68	.76	.82	.71	19.79	21.21	22.12	21.21	29	28	27	30	24	20	19	25	22
Georgia	.72	.76	.78	.58	16.53	16.63	17.83	16.90	23	22	23	29	18	16	17	23	18
Ohio	.51	.42	.42	.42	19.95	20.22	19.86	20.05	39	48	47	48	34	41	42	38	33
Indiana	.49	.42	.46	.43	16.04	17.07	15.78	16.42	33	41	34	38	28	37	28	30	28
Illinois	.41	.40	.45	.47	15.88	16.83	16.54	15.91	39	42	37	34	35	39	32	26	32
Michigan	.50	.45	.55	.51	19.68	20.82	20.78	19.90	39	46	38	39	32	39	32	33	31
Wisconsin	.51	.49	.45	.49	19.99	20.49	21.91	20.69	39	42	49	42	36	40	48	38	38
Minnesota	.42	.40	.38	.46	17.14	18.26	17.73	17.15	41	46	47	37	37	43	42	28	36
Iowa	.43	.43	.43	.46	17.23	18.77	18.84	17.81	40	44	44	39	36	42	39	32	36
Missouri	.55	.55	.52	.59	14.84	15.48	15.00	14.11	27	28	29	24	25	25	26	20	22
North Dakota	.44	.38	.43	.59	11.55	13.67	13.66	11.84	26	36	32	20	23	34	27	17	27
South Dakota	.41	.38	.41	.79	15.01	14.37	14.76	11.79	37	38	36	15	34	37	34	12	32
Nebraska	.41	.50	.53	.72	14.90	16.12	14.75	14.39	36	32	28	20	33	28	27	21	28
Kansas	.47	.54	.54	.60	14.57	15.65	14.51	14.48	31	29	27	24	26	25	23	22	23
Kentucky	.81	.70	.83		17.90	17.57	21.69		22	25	26		21	23	21	24	20
Tennessee	.75	.69	.87	.69	17.21	18.61	19.04	17.92	23	27	22	26	21	21	22	25	20
Texas	.48	.50	.79	.39	15.84	16.41	14.20	18.89	33	33	18	49	32	34	12	43	24
Oklahoma	.57	.48	.55	.47	13.12	14.55	13.71	15.87	23	30	25	34	20	25	23	28	22
Montana	.51	.51	.63	.63	16.44	15.75	15.15	14.47	32	31	24	23	33	30	22	26	28
Wyoming	.48	.59	.60		17.74	17.76	19.33		37	30	32		34	30	35	35	32
Colorado	.57	.67	.74	.64	22.63	22.04	25.05	25.70	40	33	34	40	32	25	27	24	28
Utah	.74	.80	.78	.71	37.11	35.78	41.23	39.12	50	45	53	55	38	33	47	40	39
Idaho	.56	.68	.58	.56	28.07	24.98	25.48	27.54	50	37	44	49	46	36	49	40	42

Bureau of Agricultural Economics. From returns to mail inquiry sent to crop reporters.

[1] State average yields obtained by the Division of Crop and Livestock Estimates and published in the Agriculture Yearbooks, carried to nearest whole number.

TABLE 485.—*Oats: Cost of production, by yield groups, 1926*

Yield group (bushels per acre)	Number of reports	Average acreage in oats per farm	Average yield per acre	Gross cost per acre to— Prepare and plant	Harvest [1]	Market	Miscellaneous labor [2]	Fertilizer and manure	Seed	Land rent	Miscellaneous costs [3]	Total	Credit per acre (straw)	Net cost Per acre	Per bushel
		Acres	*Bu.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*
All States:															
17 and under	575	34	9	2.83	2.53	0.79	0.13	0.56	1.17	3.47	1.73	13.21	0.87	12.34	1.37
18 to 22	455	29	20	2.93	3.38	.93	.15	.78	1.26	4.37	1.83	15.63	1.11	14.52	.73
23 to 27	365	25	25	3.23	4.17	1.14	.19	1.42	1.37	4.93	2.22	18.72	1.39	17.33	.69
28 to 32	617	29	30	3.36	4.41	1.24	.15	1.02	1.36	4.99	2.28	18.81	1.79	17.02	.57
33 to 37	342	27	35	3.15	4.33	1.32	.13	1.20	1.36	5.63	2.22	19.34	1.78	17.56	.50
38 to 42	650	27	40	3.77	4.89	1.46	.19	1.45	1.43	6.09	2.66	21.94	2.20	19.74	.49
43 to 47	217	27	45	4.07	5.20	1.44	.24	1.58	1.40	6.37	2.54	22.84	2.52	20.32	.45
48 to 52	384	25	50	3.74	5.31	1.66	.25	1.50	1.42	6.76	2.71	23.35	2.38	20.97	.42
53 to 57	101	21	55	3.68	5.57	1.56	.13	1.42	1.36	7.13	2.92	23.77	2.88	20.89	.38
58 to 62	184	20	60	3.99	5.85	1.95	.64	1.48	1.43	7.69	3.31	26.34	2.34	24.00	.40
63 and over	155	21	74	4.22	7.02	2.02	.58	2.27	1.50	7.87	3.56	29.04	2.83	26.21	.35

Bureau of Agricultural Economics. From returns to mail inquiry sent to crop reporters.
Figures for 1923, 1924, and 1925, see Agriculture Yearbooks, 1924, p. 1137; 1925, p. 1335; and 1926, p. 1217.

1 Threshing is included under harvesting.
2 Includes miscellaneous labor, irrigating and water, seed treatment, and material.
3 Sacks and twine, crop insurance, use of implements, use of storage buildings, and overhead.

TABLE 486.—*Potatoes: Cost of production, 1926*

State groups	Number of reports	Average acreage in potatoes per farm	Average yield per acre	Gross cost per acre to— Prepare and plant	Cultivate	Harvest	Market	Miscellaneous labor [1]	Fertilizer and manure	Seed	Land rent	Miscellaneous costs [2]	Total	Credit per acre (culls)	Net cost Per acre	Per bushel
		Acres	*Bu.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols*	*Dols.*
Northeastern [3]	260	7	167	12.69	7.02	16.06	12.80	5.18	26.45	27.58	9.09	7.04	123.91	0.83	123.08	0.74
Eastern [4]	94	7	115	9.01	4.65	9.47	8.35	1.32	17.44	20.01	9.40	5.18	84.83	.49	84.34	.73
Southeastern [5]	20	2	106	7.36	5.14	6.61	7.67	2.10	14.45	17.04	6.57	6.20	73.14	.02	73.12	.69
Central [6]	226	4	105	7.29	3.98	9.91	6.83	1.61	6.69	19.59	7.53	3.59	67.02	.08	66.94	.64
North Central [7]	306	5	121	7.38	4.05	9.75	7.99	2.24	6.75	15.14	5.44	3.94	62.68	.28	62.40	.52
West South Central [8]	22	6	84	8.32	4.55	8.49	6.47	.71	7.18	19.31	6.68	2.87	64.58	.23	64.35	.77
Western [9]	116	8	146	9.32	4.59	13.66	10.20	3.38	4.57	16.08	11.19	10.50	83.49	1.13	82.36	.56

Bureau of Agricultural Economics. From returns to mail inquiry sent to crop reporters.

1 Includes miscellaneous labor, irrigating and water, spraying, and spray material.
2 Sacks and twine, crop insurance, use of implements, use of storage buildings, and overhead.
3 Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, and Pennsylvania.
4 Delaware, Maryland, Virginia, West Virginia, North Carolina, Kentucky, and Tennessee.
5 South Carolina, Georgia, Florida, Alabama, and Mississippi.
6 Ohio, Indiana, Illinois, Iowa, Missouri, Kansas, and Nebraska.
7 Michigan, Wisconsin, Minnesota, North Dakota, and South Dakota.
8 Louisiana, Texas, Oklahoma, and Arkansas.
9 Montana, Wyoming, Colorado, New Mexico, Utah, Idaho, Washington, Oregon, and California.

TABLE 487.—*Potatoes: Comparative production costs, by State groups, in 1923, 1924, 1925, and 1926*

State groups	Number of reports				Net cost per acre				Net cost per bushel				Yield per acre			
	1923	1924	1925	1926	1923	1924	1925	1926	1923	1924	1925	1926	1923	1924	1925	1926
					Dols.	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Bus.*	*Bus.*	*Bus.*	*Bus.*
Northeastern [1]	574	431	328	260	105.50	99.54	107.88	123.08	0.62	0.58	0.72	0.74	170	171	149	167
Eastern [2]	231	167	130	94	80.46	82.06	78.51	84.34	.69	.67	.79	.73	116	123	100	115
Southeastern [3]	112	53	49	20	75.66	80.01	71.97	73.12	.78	.82	.87	.69	97	98	83	106
Central [4]	407	212	251	226	52.48	56.09	58.00	66.94	.52	.51	.60	.64	101	111	96	105
North Central [5]	964	508	423	396	51.34	47.10	54.76	62.40	.44	.38	.52	.52	116	125	106	121
West South Central [6]	85	37	32	22	54.76	51.58	68.31	64.35	.67	.68	.73	.77	82	76	93	84
Western [7]	321	181	101	116	68.83	67.83	90.57	82.36	.46	.47	.58	.56	149	144	156	146

Bureau of Agricultural Economics. From returns to mail inquiry sent to crop reporters.

[1] Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, and Pennsylvania.
[2] Delaware, Maryland, Virginia, West Virginia, North Carolina, Kentucky, and Tennessee.
[3] South Carolina, Georgia, Florida, Alabama, and Mississippi.
[4] Ohio, Indiana, Illinois, Iowa, Missouri, Kansas, and Nebraska.
[5] Michigan, Wisconsin, Minnesota, North Dakota, and South Dakota.
[6] Louisiana, Texas, Oklahoma, and Arkansas.
[7] Montana, Wyoming, Colorado, New Mexico, Utah, Idaho, Washington, Oregon, and California.

TABLE 488.—*Cotton: Cost of production, by yield groups, 1926*

Yield group (pounds of lint per acre)	Number of reports	Average acreage in cotton per farm	Average yield of lint per acre	Gross cost per acre to—										Credit per acre (cotton seed)	Net cost of lint	
				Prepare and plant	Cultivate	Harvest and market	Miscellaneous labor [1]	Fertilizer and manure	Seed	Ginning	Land rent	Miscellaneous costs [2]	Total		Per acre	Per pound
		Acres	*Lbs.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*
60 and under	32	50	41	3.76	4.17	2.60	0.35	1.64	1.07	0.71	4.22	1.77	20.29	0.85	19.44	0.47
61 to 100	91	68	89	4.16	4.54	4.69	.40	2.09	1.01	1.13	4.55	1.82	24.39	1.82	22.57	.25
101 to 140	114	77	126	3.82	5.02	5.75	.68	2.54	1.14	1.67	5.37	2.34	28.33	2.67	25.66	.20
141 to 180	166	74	164	3.90	5.28	7.18	.40	2.67	1.10	2.05	4.92	2.15	29.65	3.60	26.05	.16
181 to 220	130	58	200	4.02	5.57	8.22	.57	3.55	1.05	2.31	5.15	2.83	33.27	3.71	29.56	.15
221 to 260	200	47	246	4.29	5.74	9.29	.59	4.49	1.09	2.90	4.90	2.86	36.15	4.83	31.32	.13
261 to 300	106	54	292	4.65	6.00	10.99	.67	4.43	1.27	3.77	6.79	2.92	41.49	5.09	36.40	.12
301 to 340	48	68	326	4.61	7.28	11.76	.91	5.13	1.27	3.92	7.49	2.92	45.29	5.34	39.95	.12
341 to 380	46	82	360	4.14	5.88	12.10	.54	5.52	1.15	4.09	6.08	3.19	42.69	6.45	36.24	.10
381 to 420	56	64	400	5.23	7.62	13.59	1.64	6.73	1.49	5.10	8.79	3.95	54.14	7.02	47.12	.12
421 to 460	19	44	447	4.56	6.26	14.14	1.22	8.33	1.23	5.47	9.87	2.51	53.59	8.47	45.12	.10
461 to 500	41	27	493	4.48	6.81	16.89	.68	7.53	1.38	5.71	8.24	3.71	55.43	9.30	46.13	.09
501 and over	21	29	582	4.64	7.65	19.23	.83	8.43	1.67	5.89	9.82	4.24	62.40	10.38	52.02	.09

Bureau of Agricultural Economics. From returns to mail inquiry sent to crop reporters.

[1] Includes miscellaneous labor, irrigating and water, dusting, and dusting material.
[2] Includes picking sacks and sheets, crop insurance, use of implements, use of storage buildings, and overhead.

TABLE 489.—*Cotton: Comparative production costs, by yield groups, in 1923, 1924, 1925, and 1926*

Yield (pounds of lint per acre)[1]	Farms reporting				Average yield of lint per acre				Net cost of lint per pound[2]			
	1923	1924	1925	1926	1923	1924	1925	1926	1923	1924	1925	1926
	No.	*No.*	*No.*	*No.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
0 and under	281	24	47	32	40	36	34	41	61	51	71	47
1 to 100	451	107	79	91	89	93	89	89	30	27	31	25
01 to 140	407	186	112	114	124	125	126	126	22	20	21	20
41 to 180	394	284	207	166	161	161	162	164	17	18	18	16
81 to 220	279	221	187	130	200	200	202	200	16	16	16	15
21 to 260	257	288	277	200	245	246	246	246	13	13	13	13
61 to 300	165	156	158	106	290	293	292	292	12	13	12	12
01 to 340	34	39	54	48	324	324	325	326	14	11	12	12
41 to 380	54	46	70	46	356	361	360	360	12	11	12	10
81 to 420	94	60	79	56	401	400	400	400	11	10	10	12
21 to 460	27	21	39	19	444	448	446	447	11	10	11	10
61 to 500	60	33	65	41	495	493	496	493	10	08	09	09
01 and over	16	6	31	21	618	637	600	582	09	07	08	09

Bureau of Agricultural Economics. From returns to mail inquiry sent to crop reporters.

[1] The average yield of lint cotton in the United States has been as follows: 1923, 130.6 pounds; 1924, 157.4 pounds; 1925, 167.2 pounds; 1926, 182.6 pounds.

[2] The average cost per pound for the yield groups which closely approximated the average yields for the United States are as follows: 1923, 22 cents; 1924, 18 cents; 1925, 18 cents; 1926, 15.5 cents. At least a part of the yearly variations in costs in some of the upper and lower yield groups may be due to the small number of reports, and to the relative number of reports received each year from various sections of the Cotton Belt.

TABLE 490.—*Index numbers of net production, prices, and gross income from farm production*

[1919=100]

GROSS INCOME[1]

Year beginning July—	Grains	Fruits and vegetables	Meat animals	Cotton and cottonseed	Dairy and poultry products	Total
1919	100	100	100	100	100	100
1920	75	98	70	56	97	81
1921	42	79	58	34	80	59
1922	46	81	65	55	82	66
1923	46	87	65	71	92	72
1924	61	76	79	76	91	76
1925	53	97	86	77	100	81
1926	48	86	87	57	104	77

PRICES RECEIVED BY PRODUCERS[2]

Year beginning July—	Grains	Fruits and vegetables	Meat animals	Cotton and cottonseed	Dairy and poultry products	Total
1919	100	100	100	100	100	100
1920	66	80	72	48	89	72
1921	42	80	58	48	67	58
1922	47	58	59	65	70	61
1923	48	62	56	80	73	64
1924	62	59	69	64	70	66
1925	57	79	79	55	75	69
1926	52	63	77	35	77	63

NET PRODUCTION[3]

Year beginning July—	Grains	Fruits and vegetables	Meat animals	Cotton and cottonseed	Dairy and poultry products	Total
1919	100	100	100	100	100	100
1920	113	122	97	116	110	112
1921	100	99	99	70	119	101
1922	99	140	111	85	118	109
1923	98	141	117	88	127	113
1924	98	130	113	119	130	116
1925	93	121	108	141	132	117
1926	94	137	113	163	135	121

Bureau of Agricultural Economics.

[1] Obtained from statement of Income from Agricultural Production in the United States, Crops and Markets, July, 1926.

[2] Prices used in computing gross income from farm production weighted by average of quantities (1919–1925) produced for sale and farm consumption, exclusive of production for feed and seed.

[3] Net production defined as production for sale and for farm family use, excluding production used for feed and seed. The indexes are obtained by dividing the indexes of gross income by the indexes of prices.

TABLE 491.—*Current value of capital invested, rates earned on agricultural and nonagricultural capital, and income per farm available for capital, labor, and management, 1919–1926*

Year beginning July	Current value of all capital invested in agricultural production [1]	Current value of operator's net investment in agricultural production [2]	Rates earned for capital and management on—			Income j availab	
			Total capital investment	Operator's net capital investment	All nonagricultural corporations [3]	Capital, labor, and management [4]	Labor and management [5]
	1,000,000 dollars	*1,000,000 dollars*	*Per cent*	*Per cent*	*Per cent*	*Dollars*	*Dollars*
1919	79,449	47,065	6.3	5.7		1,246	917
1920	73,139	41,172	.5	−4.2		684	397
1921	63,811	34,711	1.2	−2.3	4.5	514	270
1922	62,549	34,321	3.2	1.2	11.1	682	440
1923	60,472	33,046	3.5	1.6	13.0	766	533
1924	59,743	32,574	4.4	3.2	12.0	854	624
1925	59,712	32,727	5.2	4.3	13.0	922	690
1926	58,255	31,812	4.2	2.7	(6)	853	627

Bureau of Agricultural Economics.

[1] As of Jan. 1 in the period indicated. Values include land, buildings (dwellings and other), livestock, implements, machinery, motor vehicles, and an allowance for cash working capital.
[2] Total capital investment less property rented from nonoperators and debts owed to nonoperators.
[3] Calendar year net profits including compensation to officers (after deducting depreciation) as percentages of "fair" (market) value of capital stock of all corporations estimated by the United States Treasury Department at 75.4 billion dollars in 1921, 75.8 in 1922, 81.8 in 1924, and 95.2 in 1925.
[4] Net income available for operators' capital, labor, and management calculated on the basis of the number of farmers interpolated between 6,448,000 in 1920 and 6,372,000 in 1925.
[5] After allowing 4½ per cent on operators' net capital investment.
[6] Available data indicate that at least the same percentage was earned in 1926 as in 1925.

TABLE 492.—*Gross value of farm production and gross income, 1919–1926*

Year beginning July	Gross value of all farm production [1]	Deductions for products fed, used for seed, and waste [2]	Gross income fr					
			Total	Grains	Meat animals	Fruits and vegetables	Cotton and cottonseed	Dairy and poultry products
	1,000,000 dollars	*1,000,000 dollars*	*1,000,000 dollars*	*1,000,000 dollars*	*1,000,000 dollars*	*1,000,000 dollars*	*1,000,000 dollars*	*1,000,000 dollars*
1919	24,025	8,306	15,719	3,005	3,346	1,747	2,271	3,598
1920	17,800	5,132	12,668	2,246	2,328	1,705	1,272	3,502
1921	12,894	3,680	9,214	1,260	1,932	1,379	760	2,877
1922	14,909	4,543	10,366	1,393	2,180	1,410	1,251	2,957
1923	16,249	4,961	11,288	1,393	2,167	1,528	1,608	3,315
1924	17,086	5,083	12,003	1,842	2,619	1,333	1,719	3,258
1925	16,995	4,325	12,670	1,594	2,848	1,686	1,749	3,589
1926	16,316	4,236	12,080	1,456	2,892	1,511	1,291	3,754

Bureau of Agricultural Economics.

[1] These gross values of all farm production are here evaluated in terms of crop year (practically July-June) production and weighted average farm prices.
[2] These deductions, to obtain gross income, cover portions of crops and dairy products fed to livestock, used for seed in further crop production, and waste. For the industry as a whole these deductions constitute raw materials, the income from which is derived from the finished products sold or consumed in the farm home.

TABLE 493.—*Distribution of gross income from agricultural production, 1919–1926*

Year beginning July	Gross income	Value of food and fuel consumed on farms	Cash income from sales	Distribution of cash income					
				Wages to hired labor [1]	Operating costs	Taxes on operator-owned investment	Rent on property rented from nonoperators	Interest on debts to nonoperators	Balance available for living expenses, etc.
	1,000,000 dollars	*1,000,000 dollars*	*1,000,000 dollars*	*1,000,000 dollars*	*1,000,000 dollars*	*1,000,000 dollars*	*1,000,000 dollars*	*1,000,000 dollars*	*1,000,000 dollars*
1919	15,719	2,887	12,832	1,492	3,306	388	1,712	787	5,147
1920	12,668	2,645	10,023	1,732	3,689	545	1,399	897	1,761
1921	9,214	2,129	7,085	1,088	2,448	582	959	840	1,168
1922	10,366	2,168	8,198	1,061	2,501	617	1,014	809	2,196
1923	11,288	2,360	8,928	1,204	2,760	626	1,034	774	2,530
1924	12,003	2,327	9,676	1,207	2,865	635	1,094	758	3,117
1925	12,670	2,535	10,135	1,216	3,053	654	1,127	758	3,327
1926	12,080	2,531	9,549	1,238	2,987	654	1,042	750	2,878

Bureau of Agricultural Economics.

[1] Includes value of board as well as cash.

TABLE 494.—*Index numbers of farm prices, United States, 1910–1927*

[August, 1909—July 1914=100]

GRAINS

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
1910	110	112	112	109	107	106	107	106	102	97	92	90	104
1911	91	90	88	89	92	94	97	99	101	104	103	102	96
1912	104	107	110	116	123	122	115	106	100	95	87	82	106
1913	84	86	86	88	91	94	93	95	98	97	96	97	92
1914	97	98	99	100	101	100	97	104	111	110	108	111	103
1915	123	134	136	138	139	127	113	115	106	101	99	102	120
1916	112	115	111	111	113	110	113	127	138	147	158	157	126
1917	161	169	179	217	251	246	250	248	233	223	213	213	217
1918	218	227	234	235	231	227	228	230	229	222	216	217	226
1919	217	214	220	234	245	245	248	246	233	222	220	229	231
1920	241	242	246	261	277	283	266	242	222	193	157	138	231
1921	138	136	131	118	116	117	109	103	100	94	88	88	112
1922	91	102	111	114	115	111	105	100	97	101	106	111	105
1923	113	114	117	121	123	119	112	100	111	113	110	108	114
1924	110	113	114	113	114	116	130	141	140	150	147	155	129
1925	172	178	172	152	159	164	152	157	148	135	138	140	156
1926 [1]	143	140	133	131	131	130	125	128	121	123	121	120	129
1927 [1]	120	122	121	119	127	140	139	138	134	128	120	123	128

FRUITS AND VEGETABLES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
1910	90	93	92	92	96	93	90	94	94	88	84	87	91
1911	92	94	97	106	108	121	129	125	109	94	93	102	106
1912	109	118	130	144	150	135	116	104	86	74	73	78	110
1913	79	81	81	83	92	99	103	102	96	97	96	97	92
1914	101	106	110	115	117	119	113	102	92	79	71	72	100
1915	75	78	77	82	90	91	89	85	76	79	84	89	83
1916	99	108	112	114	117	124	125	123	121	129	147	156	123
1917	167	208	241	265	283	270	219	165	146	150	155	156	202
1918	158	162	157	156	160	160	172	177	166	160	158	155	162
1919	154	156	167	179	197	205	216	219	194	186	187	206	189
1920	226	252	279	323	373	366	314	239	180	150	141	144	249
1921	136	127	125	124	132	140	156	178	171	162	162	165	148
1922	159	173	181	190	206	197	174	129	109	101	101	104	152
1923	117	122	130	146	157	161	165	151	131	123	114	114	136
1924	118	123	123	128	132	146	142	138	113	109	108	110	124
1925	122	131	138	146	162	184	178	178	142	152	194	194	160
1926 [2]	214	218	220	253	240	216	195	166	136	136	142	137	189
1927 [2]	140	142	140	147	158	201	195	172	145	138	136	141	155

[1] Kafir omitted.

[2] Onions and cabbage omitted.

TABLE 494.—*Index numbers of farm prices, United States, 1910–1927*—Contd.

[August, 1909—July 1914=100]

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
MEAT ANIMALS													
1910	99	100	109	115	110	109	103	98	102	101	96	93	103
1911	96	93	92	88	84	82	83	88	88	84	83	82	87
1912	83	85	87	96	98	96	95	100	103	104	99	99	95
1913	99	103	109	113	109	110	111	110	109	110	108	107	108
1914	109	112	114	114	113	112	114	118	117	111	106	104	112
1915	103	101	101	103	106	107	106	105	106	108	101	98	104
1916	101	108	116	121	123	124	124	123	127	122	123	125	120
1917	131	144	162	177	179	177	173	178	190	194	186	190	173
1918	187	188	194	204	210	207	205	211	214	204	198	199	202
1919	201	204	211	224	227	221	228	227	197	185	177	173	206
1920	181	184	184	186	181	182	181	177	177	169	150	124	173
1921	123	119	125	114	111	105	109	112	101	98	92	91	108
1922	95	108	118	117	119	121	120	114	112	113	108	107	113
1923	110	110	110	110	108	103	105	104	112	106	100	98	106
1924	101	102	104	106	107	105	103	116	115	121	115	113	109
1925	123	126	145	146	139	139	148	149	143	141	136	136	139
1926	140	146	147	146	148	154	152	144	148	148	142	140	146
1927	140	143	144	143	137	129	131	136	142	145	141	138	139
DAIRY PRODUCTS													
1910	106	103	98	101	97	96	95	97	100	102	103	105	100
1911	104	99	96	94	92	90	92	95	97	97	101	104	97
1912	107	108	106	103	102	99	99	100	102	105	103	103	103
1913	102	100	100	99	98	96	96	102	106	100	104	104	100
1914	105	102	100	98	96	95	96	99	101	101	103	102	100
1915	102	101	98	97	97	94	93	95	96	98	100	102	98
1916	102	99	100	99	99	97	96	100	101	106	112	116	102
1917	115	117	116	119	123	120	119	123	129	138	142	146	125
1918	149	150	148	144	142	142	141	146	152	163	169	172	152
1919	173	165	164	166	166	166	167	170	175	181	190	197	173
1920	196	194	189	192	187	182	181	185	186	190	189	182	188
1921	172	165	160	154	141	132	133	138	140	146	148	147	148
1922	140	134	133	131	126	128	127	129	133	136	140	147	134
1923	151	151	148	147	142	142	139	142	145	153	157	155	148
1924	152	150	146	134	128	126	123	120	126	130	132	137	134
1925	134	134	137	132	132	130	131	135	137	146	146	146	137
1926	147	143	141	133	130	128	129	128	133	134	141	144	136
1927	144	143	139	140	136	132	130	129	135	139	141	145	138
POULTRY PRODUCTS													
1910	130	116	98	91	90	89	88	90	98	109	120	129	104
1911	116	90	77	74	74	73	75	81	89	100	115	125	91
1912	127	118	97	84	82	81	83	88	97	109	123	124	101
1913	111	98	87	81	82	84	85	90	101	116	133	138	101
1914	130	119	99	86	85	87	89	95	105	112	123	133	105
1915	133	114	91	84	84	84	84	88	97	111	126	134	103
1916	127	110	95	90	93	96	99	106	120	137	156	166	116
1917	162	156	139	134	145	141	138	147	162	174	185	198	157
1918	210	201	108	150	148	149	160	172	185	205	229	247	185
1919	234	190	165	175	185	185	186	195	203	225	255	275	206
1920	267	236	205	189	186	185	191	204	222	243	267	272	222
1921	243	185	131	114	111	114	128	143	156	180	210	211	161
1922	176	140	118	110	114	113	111	114	132	159	187	198	139
1923	175	151	130	117	117	114	116	126	144	165	191	198	145
1924	162	157	109	105	109	115	121	132	153	176	203	217	147
1925	213	166	124	127	131	135	141	148	152	175	208	213	161
1926	172	145	128	133	135	138	137	137	155	173	202	212	156
1927	173	145	115	114	112	102	112	122	143	167	180	195	141

TABLE 494.—*Index numbers of farm prices, United States, 1910–1927*—Contd.

[August, 1909—July 1914=100]

COTTON AND COTTONSEED

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
1910	116	113	113	113	114	113	113	115	112	111	113	115	113
1911	117	114	113	114	116	116	110	100	88	77	72	70	101
1912	71	76	81	85	89	89	93	92	89	88	91	97	87
1913	97	96	95	95	94	94	94	93	101	106	102	98	97
1914	96	99	99	98	100	101	100	86	66	58	54	57	85
1915	60	65	67	73	74	72	70	70	81	99	99	100	78
1916	100	100	99	102	104	107	109	115	128	144	163	160	119
1917	148	144	149	160	169	189	204	199	197	214	232	237	187
1918	244	249	257	251	235	234	235	246	264	253	236	235	245
1919	225	208	206	213	232	249	260	259	252	277	295	292	247
1920	293	295	298	304	303	301	297	266	218	175	132	101	248
1921	93	89	80	76	78	78	79	91	130	150	137	131	101
1922	129	128	131	135	144	160	166	166	160	168	186	195	156
1923	203	215	224	222	211	207	199	190	204	221	238	253	216
1924	255	247	219	226	222	219	215	219	175	182	179	176	211
1925	182	183	195	189	184	183	186	186	178	171	144	139	177
1926	138	142	133	135	130	132	126	130	134	94	88	81	122
1927	85	94	102	101	113	119	125	136	179	169	162	153	128

ALL GROUPS

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
1910	106	105	107	108	105	104	102	102	102	101	99	99	103
1911	100	97	95	94	94	95	95	96	95	92	92	92	95
1912	94	97	99	104	107	104	101	100	98	97	95	95	99
1913	95	96	97	98	98	99	99	101	103	104	104	103	100
1914	104	105	104	104	104	104	103	104	102	98	96	97	102
1915	100	101	100	102	104	101	99	97	97	101	99	100	100
1916	104	106	108	110	111	112	113	117	123	128	137	139	117
1917	140	148	159	176	188	188	185	183	184	187	187	191	176
1918	194	197	199	200	198	196	197	203	207	204	200	201	200
1919	200	194	197	207	215	216	222	222	208	206	209	212	209
1920	219	221	222	230	235	234	224	209	194	178	158	140	205
1921	135	128	123	115	112	110	111	116	118	120	116	115	116
1922	114	118	123	123	127	128	126	120	119	123	126	131	124
1923	134	136	136	137	135	133	130	128	132	134	136	137	135
1924	137	136	131	130	129	130	132	139	132	138	137	139	134
1925	146	146	151	147	146	148	149	152	144	143	144	143	147
1926 [3]	143	143	140	140	139	139	136	133	134	130	130	127	136
1927 [3]	126	127	126	125	126	130	130	132	140	139	137	137	131

Bureau of Agricultural Economics. Prices of farm production received by producers collected monthly from a list of about 12,000 special price reporters. This list is made up almost entirely of country-town dealers, elevator managers, buyers, and merchants.

nodities by groups are as follows: Grains—wheat, corn, oats, barley, rye, kafir; fruits and vege-les, oranges, grapefruit, potatoes, sweet potatoes, beans, onions, cabbage; meat animals—beef cattle, calves, hogs, sheep, lambs; dairy products—butter (represents butter, butterfat, and cream), milk; poultry products—chickens, eggs; cotton and cottonseed; all groups includes also horses (represents horses and mules), hay, flax, tobacco, and wool.

[3] Kafir, onions, and cabbage omitted.

TABLE 495.—*Index numbers of wholesale prices, by groups of commodities, United States, 1909–1927*

[Year 1913=100]

Year	Farm products	Foods	Cloths and clothing	Fuel and lighting	Metals and metal products	Building materials	Chemicals and drugs	House-furnishing goods	Miscellaneous	ties
1909	97	97	98	84	93	95	100	92	130	97
1910	103	101	100	78	94	98	102	96	151	101
1911	93	97	96	76	89	98	102	93	111	93
1912	101	104	97	84	99	99	101	94	110	99
1913	100	100	100	100	100	100	100	100	100	100
1914	103	102	98	03	85	92	101	100	95	98
1915	104	105	98	88	09	94	134	100	. 95	101
1916	123	121	127	126	162	120	181	106	121	127
1917	190	167	175	169	231	157	202	125	148	177
1918	218	188	228	170	187	172	215	153	156	104
1919	231	207	253	181	162	201	169	184	175	206
1920	218	220	295	241	192	264	200	254	196	226
1921	124	144	180	199	129	165	136	195	123	147
1922	133	138	181	218	122	168	124	176	117	149
1923	141	144	200	185	144	189	131	183	123	154
1924	143	144	191	170	134	175	130	173	117	150
1925	158	158	190	175	130	175	134	169	135	159
1926	142	153	176	180	127	173	131	162	124	151
1927	144	149	172	162	120	163	122	158	121	147

Bureau of Agricultural Economics. Compiled from Bureau of Labor Statistics reports.

TABLE 496.—*Index numbers of wholesale prices, by groups of commodities, United States, 1923–1927*

[New basis—year 1926=100]

Year	Farm products	Foods	Hides and leather products	Textile products	Fuel and lighting	Metal and metal products	Building materials	Chemicals and drugs	House-furnishing goods	Miscellaneous	All commodities
1923	98.6	92.7	104.2	111.3	97.3	109.3	108.7	101.1	108.9	98.8	100.6
1924	100.0	91.0	101.4	106.7	92.0	106.3	102.3	98.9	104.9	95.5	98.1
1925	109.8	100.2	105.4	108.3	96.5	103.2	101.7	101.8	103.1	113.9	103.5
1926	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1927	99.4	96.5	107.9	95.7	86.5	98.2	93.3	96.6	98.2	89.9	95.4

Bureau of Agricultural Economics. Compiled from Bureau of Labor Statistics reports.

TABLE 497.—*Index numbers of wholesale prices of farm products, United States, 1923–1927*

[New basis—year 1926=100]

Calendar year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
1923	99.6	100.0	100.2	98.5	96.7	96.0	94.0	95.8	100.0	100.6	101.8	101.0	98.6
1924	101.4	98.8	95.7	97.3	95.1	94.3	98.6	102.0	100.4	103.2	103.6	108.3	100.0
1925	113.8	112.4	112.8	107.6	107.3	109.3	112.1	111.6	110.0	107.0	103.1	105.4	109.8
1926	107.4	105.1	101.7	102.8	102.4	100.9	98.6	97.2	99.3	97.9	94.7	94.9	100.0
1927	96.5	95.4	94.2	94.3	98.3	96.5	97.6	102.2	105.9	105.0	104.3	104.4	99.4

Bureau of Agricultural Economics. Compiled from Bureau of Labor Statistics reports.

TABLE 498.—*Index numbers of wholesale prices of all commodities, United States, 1909–1927*

[Year 1913=100]

Calendar year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
1909	93	93	94	95	97	97	97	98	99	101	102	103	97
1910	102	102	105	105	103	102	102	102	100	97	95	96	101
1911	95	92	93	91	90	90	92	94	95	95	95	94	93
1912	95	96	97	100	100	99	99	100	101	101	101	101	99
1913	100	100	100	100	99	99	100	100	102	101	100	99	100
1914	98	99	98	98	97	97	97	101	102	97	97	97	98
1915	98	99	99	99	100	99	100	100	100	102	104	108	101
1916	113	115	119	121	122	123	123	126	130	136	146	149	127
1917	153	157	162	173	183	185	188	189	187	183	183	182	177
1918	184	186	187	190	190	191	196	200	204	202	203	202	194
1919	199	193	196	199	202	203	212	216	210	211	217	223	206
1920	233	232	234	245	247	243	241	231	226	211	196	179	226
1921	170	160	155	148	145	142	141	142	141	142	141	140	147
1922	138	141	142	143	148	150	155	155	153	154	156	156	149
1923	156	157	159	159	156	153	151	150	154	153	152	151	154
1924	151	152	150	148	147	145	147	150	149	152	153	157	150
1925	160	161	161	156	155	157	160	160	160	158	158	156	159
1926	156	155	152	151	152	152	151	149	150	150	148	147	151
1927	147	146	145	144	144	144	145	147	149	150	150	149	147

Bureau of Agricultural Economics. Compiled from Bureau of Labor Statistics reports.

TABLE 499.—*Index numbers of wholesale prices of all commodities, United States, 1923–1927*

[New basis—1926=100]

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
1923	102.2	103.5	104.6	104.0	102.0	100.4	98.6	97.9	99.7	99.6	98.6	98.3	100.6
1924	99.8	100.0	98.7	97.6	96.1	95.1	95.9	97.4	97.5	98.6	99.6	102.1	98.1
1925	103.5	104.5	104.8	102.4	102.1	103.4	104.6	104.2	103.7	103.6	104.5	103.4	103.5
1926	103.6	102.1	100.4	100.1	100.5	100.5	99.5	99.0	99.7	99.4	98.4	97.9	100.0
1927	96.6	95.9	94.5	93.7	93.7	93.8	94.1	95.2	96.5	97.0	96.7	96.8	95.4

Bureau of Agricultural Economics. Compiled from Bureau of Labor Statistics reports.

TABLE 500.—*Index numbers of wholesale prices of agricultural commodities, United States, 1910–1927* [1]

[1910–1914=100]

Calendar year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
1910	105	104	108	106	104	103	104	105	103	100	97	97	103
1911	96	92	90	88	89	90	92	96	97	98	98	96	94
1912	98	98	99	103	104	101	101	102	103	103	102	100	101
1913	97	97	98	99	97	98	100	101	103	102	102	100	99
1914	101	101	100	99	99	100	101	109	109	103	103	102	102
1915	104	107	105	106	107	103	105	103	100	104	103	105	104
1916	108	109	110	113	114	114	116	123	128	134	142	138	121
1917	143	148	156	174	187	184	184	191	192	196	199	197	179
1918	198	200	200	203	200	201	206	213	220	215	217	218	208
1919	216	209	217	224	227	219	227	228	216	210	223	231	221
1920	239	230	231	244	248	245	240	223	216	194	180	158	221
1921	151	142	141	132	129	126	130	133	133	130	127	125	133
1922	124	132	135	135	138	137	140	135	135	139	142	144	136
1923	141	142	144	144	142	141	138	139	146	147	146	146	143
1924	144	143	140	139	138	135	141	147	145	151	150	156	144
1925	161	159	162	155	154	157	161	162	162	156	155	153	158
1926	153	151	147	148	148	150	147	144	146	144	140	141	147
1927	142	143	143	142	143	142	144	147	152	154	153	152	146

Bureau of Agricultural Economics. Compiled from Bureau of Labor Statistics reports.

[1] Commodities originating on United States farms. Includes (1) farm products group, excepting hides and skins; (2) the food group, excepting cocoa beans, coffee, copra, fish, pepper, salt, tea, and coconut oil (3) bran, cottonseed meal, linseed meal, and mill-feed middlings.

TABLE 501.—*Index numbers of wholesale prices of nonagricultural commodities, United States, 1910–1927* [1]

[1910–1914=100]

Calendar year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average
1910	103	103	104	107	106	104	103	102	100	98	97	98	102
1911	97	97	99	97	96	94	94	95	95	94	94	94	96
1912	95	96	97	100	100	100	100	101	102	103	103	104	100
1913	107	107	106	106	105	104	104	104	104	104	103	101	104
1914	100	100	101	100	98	97	96	96	97	95	94	95	97
1915	96	96	96	96	97	98	100	101	103	105	109	115	101
1916	122	126	132	134	136	137	136	135	137	143	155	166	138
1917	170	173	176	179	185	195	199	196	189	175	173	174	182
1918	177	178	180	183	186	188	192	193	195	196	196	193	188
1919	188	184	181	179	183	194	204	211	213	215	219	224	199
1920	236	244	247	254	254	250	251	249	246	237	221	208	241
1921	196	185	177	171	168	164	159	156	156	159	161	161	167
1922	158	156	155	156	164	168	177	182	179	176	175	175	168
1923	177	178	179	180	176	172	169	167	167	165	163	162	171
1924	164	166	166	164	162	159	158	159	158	158	160	163	162
1925	165	167	165	162	161	163	164	164	163	164	166	165	165
1926	165	164	162	160	160	160	159	160	161	160	161	158	161
1927	156	155	153	151	150	150	151	151	152	151	151	151	152

Bureau of Agricultural Economics. Compiled from Bureau of Labor Statistics reports.

[1] Commodities not originating on United States farms. Includes all commodities other than those in Table 500.

TABLE 502.—*Index numbers of prices, cost of living, and wages, 1913–1927*

[1910–1914=100]

Calendar year	Farm prices, August, 1909–July, 1914=100	Wholesale prices all commodities [1]	Retail prices, 22 articles of food [1]	Cost of living (32 cities) 1913=100 [2]	Farm labor, 1910–1914 =100	Union wages per hour May 15, 1913=100 [1]	Earnings New York State factory workers, June, 1914=100 [3]
1913	100	102	103	100	104	100	
1914	102	100	106	[4] 103	101	102	[5] 100
1915	100	103	104	[4] 105	102	103	101
1916	117	129	117	[4] 118	112	107	114
1917	176	180	151	[4] 142	140	114	129
1918	200	198	174	[4] 174	176	133	160
1919	209	210	192	[4] 199	206	155	185
1920	205	230	210	[4] 200	239	199	222
1921	116	150	158	[4] 174	150	205	203
1922	124	152	146	[4] 170	146	193	197
1923	135	156	151	[4] 173	166	211	214
1924	134	152	150	[4] 172	166	228	218
1925	147	162	160	[4] 178	168	238	223
1926	136	154	166	[4] 176	171	250	220
1927	131	149	160	172	170	260	231
1927							
January	126	150	164		162		232
February	127	149	161				231
March	126	148	159				234
April	125	147	158		166		230
May	126	147	160				230
June	130	146	163	173			230
July	130	147	158		172		228
August	132	149	157				231
September	140	152	159				233
October	139	153	161		175		231
November	137	152	161				228
December	137	152	161	172			233

Bureau of Agricultural Economics.

[1] Bureau of Labor Statistics.

[2] Bureau of Labor Statistics. Food (22 items prior to 1921; 43 from January, 1921); heat and light (5 items); clothing (about 75 items varying from time to time); rent (representative number of moderate-priced houses); furniture and household articles (28 items); and 42 miscellaneous articles.

[3] New York State Department of Labor.

[4] December.

[5] June.

TABLE 503.—*Index numbers of prices paid by farmers, 1910–1927*

[Base 1910–1914=100]

Year or date	Commodities used in production							Wages paid to hired labor	Commodities bought for use in production plus wages paid to hired labor	Commodities bought for family maintenance [2]	Taxes on farm property [3]
	Feed	Machinery	Fertilizer	Building materials for other than house	Equipment and supplies	Seed [1]	All commodities bought for use in production				
1910	92	101	97	100	101	-------	98	97	98	98	-------
1911	108	103	97	103	100	-------	103	97	101	100	-------
1912	90	100	101	103	100	105	98	101	99	101	-------
1913	108	98	104	101	100	94	102	104	102	99	-------
1914	102	98	101	93	99	101	99	101	100	102	100
1915	98	101	113	102	106	117	103	102	103	107	102
1916	129	111	122	118	129	112	121	112	119	125	104
1917	186	132	139	137	156	141	152	140	149	148	106
1918	196	160	173	161	180	188	176	176	176	180	118
1919	208	178	185	189	179	264	192	206	196	214	130
1920	133	188	189	205	188	149	175	239	189	227	155
1921	91	175	159	156	151	125	142	150	144	165	217
1922	118	156	131	159	139	133	140	146	142	160	232
1923	128	151	128	160	138	142	142	166	147	161	246
1924	135	155	122	159	131	148	143	166	148	162	249
1925	145	158	131	163	136	170	149	168	154	165	250
1926	120	156	129	163	142	190	144	171	150	164	253
1927	124	157	123	164	134	192	144	170	150	161	-------
1923:											
Jan. 15	121	149	123	158	137	138	138	137	138	158	-------
Apr. 15	129	150	127	160	143	143	142	148	144	163	-------
July 15	132	153	130	163	141	139	144	169	150	163	-------
Oct. 15	131	153	130	161	130	146	142	174	149	162	-------
1924:											
Jan. 15	127	154	127	160	130	142	141	159	145	163	-------
Apr. 15	128	154	117	160	137	155	142	163	147	162	-------
July 15	138	155	119	158	132	148	143	168	149	159	-------
Oct. 15	148	155	125	159	125	148	145	171	151	161	-------
1925:											
Jan. 15	154	157	127	161	126	163	149	156	150	164	-------
Apr. 15	146	158	130	161	138	178	150	163	153	166	-------
July 15	147	157	132	165	141	178	152	169	156	166	-------
Oct. 15	134	157	134	164	140	159	147	173	153	165	-------
1926:											
Jan. 15	126	155	130	162	140	183	145	159	148	165	-------
Apr. 15	119	156	128	163	143	191	144	166	149	164	-------
June 15	119	156	132	163	146	196	145	174	152	165	-------
Sept. 15	122	156	127	162	144	188	145	176	152	163	-------
Dec. 15	115	156	128	162	140	192	143	162	147	163	-------
1927:											
Mar. 15	117	157	121	164	137	202	143	166	148	161	-------
June 15	128	157	121	164	133	202	145	172	151	161	-------
Sept. 15	130	157	125	164	133	181	145	175	152	161	-------
Dec. 15	123	157	125	161	132	181	142	161	146	161	-------

Bureau of Agricultural Economics. Compiled from prices reported to the Department of Agriculture by retail dealers throughout the United States. The index numbers include only commodities bought by farmers; the commodities being weighted according to purchases reported by actual farmers in farm management and rural life studies from 1920 to 1925.

[1] 1912–1914=100.

[2] Includes food, clothing, household operating expenses, furniture and furnishings, and building material for house.

[3] 1914=100.

TABLE 504.—*Average quantity and value of the various foodstuffs consumed during one year by 1,331 farm families of selected localities of Kansas, Kentucky, Missouri, and Ohio, 1922–23*

Kind of foodstuff	Number of families using	Average per family, of all families		Proportion purchased	
		Pounds	Value	Pounds	Value
Meat, fish, eggs:				*Per cent*	*Per cent*
Beef	1,062	109	$21.10	52	52
Mutton	76	4	.77	24	27
Pork	1,294	374	51.03	5	7
Poultry	1,312	135	43.76	0	0
Veal	166	16	2.93	29	29
Other meat	88	1	.15	100	100
Fish	1,058	21	4.34	90	92
Eggs	1,307	306	45.68	0	0
Milk, cream, cheese:					
Whole milk	1,302	2,370	81.16	0	0
Skim milk	1	1	.09	0	0
Canned milk	2			100	100
Cheese	781	18	4.54	36	54
Cream	806	218	38.06	0	0
Fatty foods:					
Bacon, salt pork	1,298	137	11.26	7	24
Butter	1,274	136	49.99	9	12
Other table fats	89	2	.69	100	100
Lard	1,301	83	7.38	15	25
Other cooking fats	21		.08	100	100
Peanut butter	771	5	1.31	100	100
Salad oils	118	1	.21	100	100
Sugar, sirups:					
Honey	414	6	1.37	47	44
Maple sirup	163	6	1.01	81	75
Molasses	470	16	1.42	99	99
Corn sirup	597	29	1.71	100	100
Sugar, granulated	1,320	332	32.35	100	100
Sugar, brown	978	23	2.10	100	100
Cereals:					
Bread	1,005	93	8.93	100	100
Cornmeal	1,132	90	2.63	41	40
Cornstarch	706	4	.43	100	100
Flour, white	1,315	806	32.10	80	80
Flour, whole wheat	342	22	.85	84	75
Flour, other	324	5	.50	94	98
Macaroni, noodles	1,001	6	1.15	100	100
Rice	1,131	14	1.31	100	100
Rolled oats	958	37	3.11	100	100
Other cereal	1,005	36	3.71	95	98
Other baked goods	1,253	31	5.83	100	100
Fruit, fresh:					
Apples	1,208	444	11.48	44	51
Bananas	1,193	36	4.01	100	100
Berries	1,076	58	6.79	15	18
Cherries	802	52	3.05	23	23
Grapes	765	37	1.44	12	15
Lemons	1,219	16	2.18	100	100
Melons	889	168	5.05	30	45
Oranges, grapefruit	1,225	52	4.52	100	100
Peaches	991	127	4.15	36	43
Pears	683	68	1.56	27	32
Rhubarb	641	11	.87	5	6
Other fresh fruit	996	81	2.78	51	57
Canned, dry	575	10	2.57	100	100
Prunes	675	5	1.02	100	100
Raisins	1,066	10	1.86	100	100
Other dry fruit	294	2	.47	100	100
Vegetables, fresh:					
Beans	1,249	102	4.11	2	3
Beets	1,121	35	.71	1	1
Cabbage, cauliflower	1,183	177	5.59	13	13
Carrots	295	6	.14	6	7
Celery	720	18	1.43	60	65
Corn	1,202	209	5.04	1	1
Cucumbers	841	118	1.90	6	6
Lettuce, greens	1,201	27	3.02	8	14
Onions	1,282	65	2.85	9	9
Peas	1,086	40	1.69	1	1
Potatoes	1,318	954	19.25	24	25
Sweet potatoes	884	90	2.43	44	44
Squash, pumpkin	691	36	1.38	2	2
Tomatoes	1,260	281	4.58	2	2
Turnips	491	22	.42	7	7
Other fresh vegetables	1,147	38	2.04	1	1

TABLE 504.—*Average quantity and value of the various foodstuffs consumed during one year by 1,331 farm families of selected localities of Kansas, Kentucky, Missouri, and Ohio, 1922–23*—Continued

Kind of foodstuff	Number of families using	Average per family, of all families: Pounds	Average per family, of all families: Value	Proportion purchased: Pounds	Proportion purchased: Value
				Per cent	*Per cent*
Canned, dry	782	25	4.58	100	100
Peas, beans	1,120	56	4.09	72	65
Miscellaneous:					
Chocolate, cocoa	1,197	7	2.02	100	100
Coffee	1,224	36	12.69	100	100
Extracts	1,281	2	1.87	100	100
Gelatin	583	1	.66	100	100
Olives, pickles	378	2	.64	100	100
Peanuts	624	4	.77	96	98
Other nuts	771	12	1.17	77	92
Salt	1,298	78	1.99	100	100
Soda, baking powder	1,321	15	2.99	100	100
Spices	1,254	6	1.38	100	100
Tea	1,026	4	2.35	100	100
Vinegar	1,278	43	2.60	74	77
Yeast	587	1	.46	100	100
Other foods	82		.29		68
Total			615.97		33

Bureau of Agricultural Economics. Compiled from records taken in a field survey by agents of the bureau.

TABLE 505.—*Farm family living expenditures, Schoharie County, N. Y., and Vinton, Jackson, and Meigs Counties, Ohio* [1]

	Schoharie County, N. Y.				Vinton, Jackson, and Meigs Counties, Ohio			
	Furnished by farm	Purchased	Total	Per cent of living expenditure	Furnished by farm	Purchased	Total	Per cent of living expenditure
	Dollars	*Dollars*	*Dollars*	*Per cent*	*Dollars*	*Dollars*	*Dollars*	*Per cent*
All family living	428.0	649.6	1,077.6	100.0	399.0	528.3	927.3	100.0
Food, including groceries	224.1	252.9	477.0	44.3	319.6	134.5	454.1	49.0
Clothing		155.6	155.6	14.4		156.0	156.0	16.8
Rent (10 per cent value of house)	94.6		94.6	8.8	67.4		67.4	7.3
Furniture and furnishings		36.3	36.3	3.4		31.0	31.0	3.3
Operation goods	109.3	78.4	187.7	17.4	12.0	84.4	96.4	10.4
Maintenance of health		36.7	36.7	3.4		30.6	30.6	3.3
Advancement		57.8	57.8	5.4		44.7	44.7	4.8
Personal		12.4	12.4	1.1		29.1	29.1	3.1
Insurance		17.1	17.1	1.6		12.9	12.9	1.4
Unclassified		2.4	2.4	.2		5.1	5.1	.6
Per cent of total furnished and purchased	39.7	60.3	100.0	100.0	43.0	57.0	100.0	100.0

Bureau of Agricultural Economics.

[1] The New York study is for one year ended Sept. 30, 1924, and the Ohio study one year ended Apr. 1, 1927. Since price levels were different in these two years the value figures are not strictly comparable between the two studies.

TABLE 506.—*Distribution of value of goods used and proportion of total living furnished by farm for farm families of Schoharie County, New York, and Vinton, Jackson, and Meigs Counties, Ohio*

SCHOHARIE COUNTY, N. Y., YEAR ENDING SEPTEMBER 30, 1924

Item	Groups of value of goods used							
	Below $600	$600–$899	$900–$1,199	$1,200–$1,499	$1,500–$1,799	$1,800–$2,099	$2,100 and over	All groups
	Number	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*
Families	10	153	189	94	35	10	7	498
Average size of family (persons)	2.2	2.8	3.7	4.5	4.7	4.1	4.6	3.6
Average size of household (persons)	2.3	3.0	4.2	5.1	5.5	6.0	6.7	4.1
	Dollars	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
Average value of goods used per family	544.2	769.4	1,042.4	1,320.8	1,610.4	1,906.4	2,414.3	1,077.6
Distribution of value of goods used:	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Food	52.1	49.5	45.9	41.8	39.2	38.0	28.7	44.3
Clothing	13.4	13.3	14.5	15.5	14.5	14.5	13.7	14.4
Rent	9.7	8.9	8.4	8.5	9.7	9.4	10.1	8.8
Furniture and furnishings	.9	2.4	3.2	3.3	5.1	4.5	6.1	3.4
Operation goods	18.7	18.5	18.0	17.4	15.4	14.9	13.0	17.4
Maintenance of health	1.9	2.3	3.2	4.7	4.4	2.7	2.6	3.4
Advancement	2.3	3.5	4.0	5.2	8.0	11.8	19.8	5.4
Personal	.9	1.0	1.1	1.2	1.3	1.7	1.3	1.1
Insurance, life and health	.1	.5	1.5	2.0	2.4	2.5	3.9	1.6
Unclassified	.0	.1	.2	.4	--------	--------	.8	.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Living furnished by farm	44.9	44.5	40.2	37.4	36.8	36.5	29.2	39.7
Living purchased	55.1	55 5	59.8	62.6	63.2	63.5	70.8	60.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Food furnished by farm	42.6	48.3	46.1	46.8	47.5	49.2	45.8	47.0
Food purchased	57.4	51.7	53.9	53.2	52.5	50.8	54.2	53.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

VINTON, JACKSON, AND MEIGS COUNTIES, OHIO, YEAR ENDING APRIL 30, 1927

	Number	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*
Families	49	102	93	39	9	5	3	300
Average size of family (persons)	2.4	3.5	4.1	5.2	6.1	5.8	7.0	3.9
Average size of household (persons)	2.6	3.8	4.7	5.7	6.4	6.8	9.7	4.3
	Dollars	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
Average value of good used per family	485.1	754.7	1,036.8	1,314.3	1,583.4	1,961.2	2,419.3	932.5
Distribution of value of goods used:	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Food	58.1	51.7	49.3	45.0	42.9	41.4	36.8	49.0
Clothing	11.7	14.4	17.1	19.4	21.3	21.2	19.4	16.7
Rent	8.4	8.5	6.9	6.2	5.7	7.3	4.1	7.2
Furniture and furnishings	2.1	2.7	3.0	3.4	6.5	8.0	4.6	3.3
Operation goods	10.8	11.2	10.5	9.8	10.1	6.3	13.4	10.5
Maintenance of health	2.6	2.7	3.4	4.0	2.8	2.0	8.9	3.3
Advancement	3.2	3.4	4.7	6.8	5.9	6.1	9.7	4.9
Personal	2.9	3.6	3.3	2.6	2.5	4.2	1.9	3.1
Insurance, life and health	.2	.6	1.5	2.2	2.3	3.5	1.2	1.4
Unclassified	--------	1.2	.3	.6	--------	--------	--------	.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Living furnished by farm	49.4	46.5	42.8	39.3	37.5	36.7	33.5	43.0
Living purchased	50.6	53.5	57.2	60.7	62.5	63.3	66.5	57.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Food furnished by farm	66.3	70.4	70.5	71.5	72.5	69.6	77.5	70.4
Food purchased	33.7	29 6	29.5	28.5	27.5	30.4	22.5	29.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Bureau of Agricultural Economics.

TABLE 507.—*Average farm business and farm family living expenditures for one year in selected counties*

Item	Schoharie County, N. Y.	Vinton, Jackson, and Meigs Counties, Ohio
Period of study, year ended	Sept. 30, 1924	Apr. 1, 1927
Number of families	498	300
Size of household, persons	4.1	4.3
Size of farm, acres	153.5	
Operator's capital per farm ... dollars	5,785	4,214
Farm receipts during year:		
Crops sold ... do	150	68
Livestock and livestock products sold ... do	1,732	690
Miscellaneous farm receipts ... do	143	217
Total ... do	2,025	975
Farm expenses during year:		
Livestock purchased ... do	137	73
Current expenses ... do	1,101	512
Total ... do	1,238	585
Excess receipts from farming ... do	787	390
Inventory change, net increase ... do	68	79
Family income from farm ... do	855	469
Receipts from outside sources ... do	23	93
Farm family income—all sources ... do	878	562
Family living purchased ... do	649	528
Increased capital or savings ... do	229	34

Bureau of Agricultural Economics.

TABLE 508.—*Average prevailing farm wage rates, by geographic divisions*[1]

Basis of rate, year, and month	North Atlantic States	North Central States	South Atlantic States	South Central States	Western States	United States
Per month with board:	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
1910	21.47	24.11	13.76	15.56	32.41	19.58
1915	23.85	26.23	14.70	16.13	33.51	21.08
1920	52.37	56.44	34.88	36.60	73.36	47.24
1921	38.36	35.53	21.64	22.75	47.75	30.25
1922	37.57	33.73	21.36	22.35	46.22	29.31
1923	43.52	38.63	24.39	24.55	51.02	33.09
Oct. 1, 1922	37.41	34.49	20.53	21.48	45.61	29.03
Jan. 1, 1923	36.85	31.61	20.23	21.48	43.55	27.87
Apr. 1, 1923	41.77	37.04	22.07	22.52	46.43	30.90
July 1, 1923	49.06	40.97	24.14	24.49	56.11	34.64
Oct. 1, 1923	47.55	40.14	24.68	25.26	54.66	34.56
Jan. 1, 1924	42.51	35.51	24.09	23.78	48.77	31.55
Apr. 1, 1924	45.35	39.68	25.04	24.52	49.66	33.57
July 1, 1924	46.04	39.71	26.28	25.85	50.00	34.34
Oct. 1, 1924	45.50	40.04	25.46	26.24	50.40	34.38
Jan. 1, 1925	41.38	34.20	24.89	24.01	46.64	31.07
Apr. 1, 1925	45.03	40.18	25.30	24.70	49.85	33.86
July 1, 1925	46.35	40.72	26.38	25.75	52.92	34.94
Oct. 1, 1925	45.29	40.80	26.20	26.32	52.02	34.91
Jan. 1, 1926	43.20	35.23	25.17	24.27	48.05	31.82
Apr. 1, 1926	46.20	40.61	26.16	24.84	51.00	34.38
July 1, 1926	48.16	42.79	26.79	26.07	54.96	36.10
Oct. 1, 1926	47.75	41.91	26.76	27.14	53.61	36.00
Jan. 1, 1927	44.42	37.12	25.55	24.72	50.36	32.94
Apr. 1, 1927	47.21	41.30	25.24	24.46	52.55	34.53
July 1, 1927	47.65	42.97	25.53	25.38	54.39	35.59
Oct. 1, 1927	47.01	42.47	25.77	25.57	56.39	35.68
Jan. 1, 1928	43.33	36.38	25.40	24.68	49.57	32.50
Per month, without board:						
1910	32.95	33.82	19.77	22.27	46.03	28.04
1915	35.66	36.25	21.06	23.06	48.37	29.97
1920	76.18	75.50	47.37	52.07	99.81	65.05
1921	57.92	49.77	31.31	33.21	68.82	43.58
1922	56.51	47.31	30.71	32.16	66.98	42.09
1923	63.54	53.23	34.75	35.06	72.24	46.74
Oct. 1, 1922	55.41	48.29	30.00	30.99	67.21	41.79
Jan. 1, 1923	54.74	45.27	29.62	31.06	64.19	40.50

[1] Yearly averages are from reports by crop reporters, giving average wages for the year in their localities.

TABLE 508.—*Average prevailing farm wage rates, by geographic divisions*—Con.

Basis of rate, year, and month	North Atlantic States	North Central States	South Atlantic States	South Central States	Western States	United States
Per month, without board—Continued.	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
Apr. 1, 1923	61.32	51.34	32.32	32.97	67.46	44.41
July 1, 1923	70.63	56.37	34.12	34.91	78.08	48.61
Oct. 1, 1923	67.00	55.06	34.72	36.38	76.45	48.42
Jan. 1, 1924	63.66	50.10	34.52	34.75	70.83	45.53
Apr. 1, 1924	66.91	53.69	35.21	35.43	71.99	47.38
July 1, 1924	66.64	53.39	36.56	37.04	71.83	48.02
Oct. 1, 1924	66.36	54.60	37.08	37.05	71.01	48.46
Jan. 1, 1925	62.42	48.26	35.37	35.25	69.29	45.04
Apr. 1, 1925	66.30	53.48	36.03	35.55	71.42	47.40
July 1, 1925	67.34	54.30	37.41	36.56	73.74	48.55
Oct. 1, 1925	66.88	55.10	36.84	37.25	75.19	48.99
Jan. 1, 1926	65.09	50.54	36.32	35.16	70.63	46.26
Apr. 1, 1926	68.46	54.48	36.78	36.20	72.90	48.40
July 1, 1926	69.16	56.04	37.86	37.19	77.43	49.89
Oct. 1, 1926	68.67	56.12	37.58	38.15	77.31	50.10
Jan. 1, 1927	67.30	52.18	35.66	35.09	73.27	47.07
Apr. 1, 1927	69.43	55.19	36.24	34.72	76.38	48.47
July 1, 1927	69.91	56.65	36.87	35.75	77.62	49.52
Oct. 1, 1927	69.03	56.67	36.44	36.85	78.33	49.77
Jan. 1, 1928	66.36	50.81	36.36	35.25	73.18	46.75
Per day, with board:						
Oct. 1, 1922	2.16	1.96	1.04	1.07	2.32	1.56
Jan. 1, 1923	2.14	1.75	1.02	1.05	2.10	1.46
Apr. 1, 1923	2.28	1.88	1.10	1.10	2.20	1.55
July 1, 1923	2.80	2.25	1.28	1.27	2.67	1.84
Oct. 1, 1923	2.96	2.56	1.36	1.39	2.81	2.02
Jan. 1, 1924	2.60	2.20	1.26	1.26	2.47	1.79
Apr. 1, 1924	2.64	2.17	1.30	1.25	2.31	1.77
July 1, 1924	2.69	2.24	1.38	1.41	2.33	1.87
Oct. 1, 1924	2.80	2.44	1.36	1.39	2.40	1.93
Jan. 1, 1925	2.50	2.04	1.41	1.29	2.23	1.74
Apr. 1, 1925	2.63	2.16	1.35	1.26	2.22	1.77
July 1, 1925	2.73	2.27	1.41	1.38	2.49	1.89
Oct. 1, 1925	2.78	2.45	1.42	1.40	2.49	1.95
Jan. 1, 1926	2.59	2.08	1.37	1.28	2.33	1.76
Apr. 1, 1926	2.63	2.15	1.35	1.27	2.32	1.78
July 1, 1926	2.72	2.35	1.38	1.38	2.53	1.91
Oct. 1, 1926	2.82	2.41	1.42	1.46	2.51	1.97
Jan. 1, 1927	2.65	2.15	1.35	1.29	2.32	1.79
Apr. 1, 1927	2.67	2.17	1.33	1.25	2.37	1.78
July 1, 1927	2.82	2.32	1.36	1.34	2.48	1.89
Oct. 1, 1927	2.83	2.47	1.35	1.36	2.67	1.96
Jan. 1, 1928	2.62	2.12	1.31	1.26	2.36	1.76
Per day, without board:						
Oct. 1, 1922	2.88	2.58	1.40	1.46	3.03	2.07
Jan. 1, 1923	2.84	2.37	1.36	1.43	2.84	1.97
Apr. 1, 1923	3.06	2.53	1.47	1.49	2.93	2.09
July 1, 1923	3.65	3.00	1.70	1.68	3.52	2.44
Oct. 1, 1923	3.79	3.27	1.72	1.77	3.58	2.58
Jan. 1, 1924	3.47	2.91	1.70	1.67	3.31	2.38
Apr. 1, 1924	3.48	2.88	1.71	1.63	3.13	2.34
July 1, 1924	3.51	2.94	1.77	1.80	3.16	2.43
Oct. 1, 1924	3.57	3.12	1.77	1.85	3.25	2.51
Jan. 1, 1925	3.24	2.75	1.80	1.69	3.02	2.31
Apr. 1, 1925	3.43	2.83	1.76	1.64	3.05	2.33
July 1, 1925	3.54	2.97	1.84	1.71	3.25	2.44
Oct. 1, 1925	3.58	3.14	1.84	1.83	3.33	2.53
Jan. 1, 1926	3.42	2.80	1.78	1.64	3.14	2.33
Apr. 1, 1926	3.45	2.84	1.76	1.67	3.17	2.35
July 1, 1926	3.52	3.04	1.80	1.78	3.35	2.48
Oct. 1, 1926	3.62	3.08	1.86	1.91	3.37	2.55
Jan. 1, 1927	3.41	2.84	1.77	1.69	3.18	2.36
Apr. 1, 1927	3.47	2.88	1.75	1.66	3.23	2.37
July 1, 1927	3.61	3.04	1.78	1.67	3.29	2.44
Oct. 1, 1927	3.62	3.14	1.78	1.75	3.45	
Jan. 1, 1928	3.42	2.81	1.74	1.66	3.18	

Bureau of Agricultural Economics. Based upon returns from crop reporters. Prior to 1922 inquiry made annually.

TABLE 509.—*Farm wage rates and index numbers, 1866–1927*

[1910–1914=100]

Year	Average yearly farm wage[1]				Weighted average wage rate per month[2]	Index numbers of farm wages
	Per month—		Per day—			
	With board	Without board	With board	Without board		
	Dols.	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*
1866[3]	10.09	15.50	0.64	0.90	13.14	55
1869	9.97	15.50	.63	.87	12.93	54
1874 or 1875	11.16	17.10	.68	.94	14.19	59
1877 or 1879[4]	10.86	16.79	.61	.84	13.34	56
1879 or 1880	11.70	17.53	.64	.89	14.14	59
1880 or 1881	12.32	18.52	.67	.92	14.82	62
1881 or 1882	12.88	19.11	.70	.97	15.48	65
1884 or 1885	13.08	19.22	.71	.96	15.58	65
1887 or 1888	13.29	19.67	.72	.98	15.87	66
1889 or 1890	13.29	19.45	.72	.97	15.79	66
1891 or 1892	13.48	20.02	.73	.98	16.06	67
1893	13.85	19.97	.72	.92	15.93	67
1894	12.70	18.57	.65	.84	14.60	61
1895	12.75	18.74	.65	.85	14.69	62
1898	13.29	19.16	.71	.94	15.58	65
1899	13.90	19.97	.75	.99	16.34	68
1902	15.51	22.12	.83	1.09	18.12	76
1906	18.73	26.19	1.03	1.32	21.92	92
1909	20.48	28.09	1.04	1.31	23.00	96
1910	19.58	28.04	1.07	1.40	23.08	97
1911	19.85	28.33	1.07	1.40	23.25	97
1912	20.46	29.14	1.12	1.44	24.01	101
1913	21.27	30.21	1.15	1.48	24.83	104
1914	20.90	29.72	1.11	1.44	24.26	101
1915	21.08	29.97	1.12	1.45	24.46	102
1916	23.04	32.58	1.24	1.60	26.83	112
1917	28.64	40.19	1.56	2.00	33.42	140
1918	35.12	49.13	2.05	2.61	42.12	176
1919	40.14	56.77	2.44	3.10	49.11	206
1920	47.24	65.05	2.84	3.56	57.01	239
1921	30.25	43.58	1.66	2.17	35.77	150
1922	29.31	42.09	1.64	2.14	34.91	146
1923	33.09	46.74	1.91	2.45	39.64	166
1924[5]	33.34	47.22	1.88	2.44	39.67	166
1925[5]	33.88	47.80	1.89	2.46	40.12	168
1926[5]	34.86	48.86	1.91	2.49	40.92	171
1927[5]	34.58	48.63	1.90	2.46	40.21	170
1923—January	27.87	40.50	1.46	1.97	32.61	137
April	30.90	44.41	1.55	2.09	35.42	148
July	34.64	48.61	1.84	2.44	40.30	169
October	34.56	48.42	2.02	2.58	41.52	174
1924—January	31.55	45.53	1.79	2.38	38.01	159
April	33.57	47.38	1.77	2.34	38.95	163
July	34.34	48.02	1.87	2.43	40.15	168
October	34.38	48.46	1.93	2.51	40.81	171
1925—January	31.07	45.04	1.74	2.31	37.24	156
April	33.86	47.40	1.77	2.33	39.04	163
July	34.94	48.55	1.89	2.44	40.62	170
October	34.91	48.99	1.95	2.53	41.28	173
1926—January	31.82	46.26	1.76	2.33	37.94	159
April	34.38	48.40	1.78	2.35	39.56	166
July	36.10	49.89	1.91	2.48	41.59	174
October	36.00	50.10	1.97	2.55	42.10	176
1927—January	32.94	47.07	1.79	2.36	38.79	162
April	34.53	48.47	1.78	2.37	39.71	166
July	35.59	49.52	1.89	2.44	41.07	172
October	35.68	49.77	1.96	2.51	41.71	175
1928—January	32.50	46.75	1.76	2.34	38.35	161

[1] Yearly averages are from reports by crop reporters ,giving average wages for the year in their localities.
[2] This column has significance only as an essential step in computing the wage index.
[3] Years 1866 to 1878 in gold.
[4] 1877 or 1878, 1878 or 1879 (combined).
[5] Weighted average quarterly, April (weight 1), July (weight 5), October (weight 5), and January, 1925 (weight 1).

TABLE 510.—*Wages: Male farm labor, by States, quarterly, 1927*

State and division	Per month, with board				Per month, without board				Per day, with board[1]				Per day, without board			
	Jan.	Apr.	July	Oct.	Jan.	Apr.	July	Oct.	Jan.	Apr.	July	Oct.	Jan.	Apr.	July	Oct.
	Dols.	*Dols.*	*Dols*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols*	*Dols.*	*Dols.*	*Dols.*	*Dols.*	*Dols.*
Maine	42.00	43.00	46.00	45.00	63.00	62.00	65.00	66.00	2.35	2.25	2.40	2.75	3.00	3.00	3.10	3.30
New Hampshire	47.00	46.00	48.00	49.00	73.00	70.00	71.00	71.00	2.65	2.50	2.55	2.70	3.25	3.30	3.40	3.45
Vermont	44.00	50.00	47.00	47.00	66.00	70.00	67.00	69.00	2.40	2.40	2.50	2.55	3.15	3.10	3.25	3.35
Massachusetts	49.00	48.00	51.00	52.00	78.00	75.00	77.00	83.00	2.75	2.50	2.95	2.90	3.30	3.50	3.80	3.75
Rhode Island	54.00	54.00	50.00	52.00	86.00	84.00	78.00	82.00	3.00	2.90	2.90	2.70	3.75	3.75	3.60	3.70
Connecticut	53.00	55.00	53.00	54.00	87.00	84.00	84.00	82.00	3.00	2.80	2.90	2.90	3.45	3.80	3.90	3.85
New York	45.00	49.75	51.75	49.75	65.25	71.60	72.50	69.50	2.70	2.90	3.10	3.05	3.55	3.70	3.85	3.80
New Jersey	50.00	52.00	51.00	47.00	76.00	77.00	78.00	72.00	2.85	2.85	2.80	2.90	3.60	3.65	3.60	3.80
Pennsylvania	39.25	41.25	40.00	41.00	60.75	62.00	61.00	61.50	2.55	2.50	2.60	2.60	3.35	3.25	3.40	3.40
North Atlantic	44.42	47.21	47.65	47.01	67.30	69.43	69.91	69.03	2.65	2.67	2.82	2.83	3.41	3.47	3.61	3.62
Ohio	39.00	39.00	39.25	39.25	54.00	54.00	53.75	54.50	2.40	2.25	2.40	2.50	3.05	3.00	3.10	3.25
Indiana	35.25	36.50	38.00	37.00	48.50	49.50	50.00	50.00	2.15	2.15	2.20	2.25	2.75	2.75	2.85	2.90
Illinois	43.75	43.00	44.00	42.50	55.00	55.00	56.00	55.00	2.40	2.15	2.30	2.25	3.00	2.80	2.90	2.95
Michigan	39.70	42.00	43.75	42.50	56.75	59.75	60.75	59.25	2.55	2.50	2.70	2.70	3.25	3.30	3.40	3.35
Wisconsin	40.75	47.50	49.75	49.00	59.75	63.50	67.75	67.25	2.10	2.25	2.45	2.55	2.85	3.00	3.20	3.10
Minnesota	30.50	43.75	46.75	47.25	49.25	58.25	62.25	63.75	1.85	2.30	2.35	2.75	2.75	3.05	3.25	3.50
Iowa	40.00	49.00	49.00	46.75	53.25	58.00	59.00	55.00	2.30	2.35	2.45	2.55	2.90	3.00	3.25	3.15
Missouri	33.00	33.00	34.00	33.00	47.00	45.00	44.00	45.00	1.70	1.65	1.70	1.65	2.25	2.20	2.25	2.20
North Dakota	29.25	39.75	47.50	53.25	45.25	59.50	63.00	72.00	1.90	2.05	2.25	4.20	2.85	3.15	3.30	4.90
South Dakota	35.00	45.00	46.50	48.25	51.50	61.00	63.50	66.50	2.15	2.25	2.40	2.95	3.10	3.10	3.20	3.70
Nebraska	37.00	41.50	43.50	43.00	52.75	55.25	57.50	55.75	2.20	2.20	2.40	2.55	2.90	2.90	3.20	3.30
Kansas	34.00	35.25	38.00	37.75	48.00	50.50	52.00	52.25	2.05	2.05	2.60	2.40	2.75	2.80	3.20	3.10
North Central	37.12	41.30	42.97	42.47	52.18	55.19	56.65	56.67	2.15	2.17	2.32	2.47	2.84	2.88	3.04	3.14
Delaware	35.00	34.00	34.00	33.00	51.00	50.00	49.00	50.00	2.40	2.10	2.10	2.50	3.15	2.70	2.65	3.15
Maryland	35.25	37.25	37.25	36.75	50.75	53.00	53.50	52.25	2.20	2.00	2.15	2.20	2.90	2.70	2.85	2.90
Virginia	29.00	30.00	30.00	31.00	41.00	42.00	43.00	43.00	1.60	1.60	1.65	1.65	2.10	2.10	2.15	2.15
West Virginia	32.75	32.00	35.00	34.00	48.50	47.50	47.75	48.75	1.70	1.70	1.75	1.75	2.35	2.35	2.35	2.40
North Carolina	29.00	26.75	27.00	27.50	39.00	38.50	38.00	38.00	1.50	1.40	1.40	1.40	1.90	1.85	1.85	1.75
South Carolina	21.50	20.25	20.00	20.50	28.25	29.00	29.00	29.25	1.00	1.00	1.00	1.00	1.30	1.30	1.30	1.35
Georgia	19.00	19.25	20.25	20.25	27.25	27.50	29.50	28.75	.95	1.05	1.10	1.05	1.30	1.35	1.35	1.40
Florida	26.00	27.00	24.50	24.25	37.00	41.00	41.00	36.75	1.50	1.30	1.30	1.20	1.90	1.80	1.90	1.70
South Atlantic	25.55	25.24	25.53	25.77	35.66	36.24	36.87	36.44	1.35	1.33	1.36	1.35	1.77	1.75	1.78	1.78
Kentucky	26.50	27.00	27.75	27.50	35.50	36.75	38.25	38.25	1.30	1.30	1.35	1.35	1.70	1.70	1.80	1.75
Tennessee	23.75	23.50	25.00	25.75	30.50	31.50	34.50	33.50	1.15	1.10	1.20	1.15	1.45	1.55	1.55	1.55
Alabama	21.00	20.50	21.00	22.00	30.00	28.75	30.00	27.00	1.10	1.15	1.10	1.20	1.50	1.50	1.40	1.45
Mississippi	21.95	21.00	22.50	23.50	31.00	30.00	31.75	32.00	1.20	1.15	1.20	1.20	1.55	1.55	1.55	1.60
Arkansas	23.50	24.50	24.75	25.50	34.50	33.00	33.50	36.00	1.20	1.15	1.20	1.30	1.60	1.55	1.55	1.70
Louisiana	23.25	24.25	23.50	23.50	35.50	33.25	34.00	33.00	1.30	1.15	1.20	1.25	1.65	1.50	1.55	1.60
Oklahoma	29.25	28.50	31.00	30.25	42.75	42.75	43.00	47.25	1.65	1.55	1.90	1.75	2.20	2.15	2.15	2.20
Texas	27.00	26.00	27.00	26.50	39.00	39.00	39.00	43.25	1.40	1.35	1.50	1.55	1.85	1.75	1.80	2.00
South Central	24.72	24.46	25.38	25.57	35.09	34.72	35.75	36.85	1.29	1.25	1.34	1.36	1.69	1.66	1.67	1.75
Montana	43.00	51.50	53.50	60.25	65.00	73.75	74.00	77.50	2.40	2.60	2.65	3.65	3.20	3.50	3.65	4.40
Idaho	48.50	54.25	58.50	58.25	68.75	76.25	77.25	79.50	2.45	2.50	2.75	3.05	3.25	3.10	3.45	3.75
Wyoming	44.00	45.75	48.50	51.75	64.00	68.00	71.00	73.25	2.35	2.15	2.45	2.65	3.20	3.05	3.25	3.55
Colorado	37.75	38.75	41.25	43.00	57.25	60.50	61.75	65.00	2.10	2.05	2.15	2.40	2.95	2.90	3.00	3.20
New Mexico	35.00	34.00	35.00	35.25	56.00	50.00	53.00	49.75	1.70	1.55	1.65	1.75	2.25	2.10	2.15	2.15
Arizona	45.00	43.25	43.00	50.50	70.00	70.00	70.00	69.00	1.80	1.90	1.75	2.05	2.40	2.65	2.35	2.75
Utah	59.00	56.25	57.00	59.75	75.00	75.25	77.00	80.75	2.55	2.45	2.55	2.70	3.15	3.00	3.20	3.30
Nevada	64.00	59.00	62.00	63.25	87.00	76.50	80.00	89.00	2.60	2.45	2.55	2.85	3.35	3.15	3.60	3.50
Washington	43.00	52.50	50.50	53.75	66.00	76.50	75.50	77.75	2.40	2.50	2.55	3.05	3.30	3.50	3.50	3.70
Oregon	40.50	47.25	52.00	53.25	62.00	66.75	75.25	72.00	2.15	2.30	2.60	2.70	3.05	3.15	3.25	3.45
California	62.00	62.00	64.00	65.00	88.00	90.00	90.00	90.00	2.50	2.60	2.70	2.65	3.50	3.60	3.60	3.60
Far Western	50.36	52.55	54.39	56.39	73.27	76.38	77.62	78.33	2.32	2.37	2.48	2.67	3.18	3.23	3.29	3.45
United States	32.94	34.53	35.59	35.68	47.07	48.47	49.52	49.77	1.79	1.78	1.89	1.96	2.36	2.37	2.44	2.51

Bureau of Agricultural Economics. As reported by field aid crop reporters.

[1] Includes piece work.

TABLE 511.—*Farm land including buildings: Total and per acre value, by geographic divisions and States, 1910, 1920, and 1925*

Division and State	All land in farms			Total value, including buildings			Value per acre			Buildings only			
										Total value		Value per acre	
	1925	1920	1910	1925	1920	1910	1925	1920	1910	1925	1920	1925	1920
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*Dollars*	*Dollars*	*Dollars*	*1,000 dollars*	*1,000 dollars*	*Dollars*	*Dollars*
United States	924, 319	955, 884	878, 798	49, 467, 647	66, 316, 003	34, 801, 126	53. 52	69. 38	39. 60	11, 746, 629	11, 486, 440	12. 71	12. 02
Geographic divisions:													
New England	15, 858	16. 991	19, 715	905, 627	917, 469	718, 545	57. 11	54. 00	36. 45	491, 695	429, 343	31. 01	25. 27
Middle Atlantic	37, 491	40, 573	43, 191	2, 799, 834	3, 002, 138	2, 442, 949	74. 68	73. 99	56. 56	1, 467, 376	1, 340, 462	39. 14	33. 04
East North Central	112, 752	117, 735	117, 929	11, 023, 659	14, 937, 642	8, 873, 992	97. 77	126. 87	75. 25	3, 054, 655	2, 891, 568	27. 09	24. 56
West North Central	248, 031	256, 973	232, 648	16, 530, 891	24, 469, 495	11, 614, 666	66. 64	95. 22	49. 92	3, 227, 843	3, 129, 350	13. 01	12. 18
South Atlantic	88, 590	97, 775	103, 782	4, 098, 944	5, 201, 773	2, 486, 436	46. 28	53. 20	23. 96	1, 118, 173	1, 201, 092	12. 63	12. 28
East South Central	70, 607	78, 898	81, 521	2, 480, 830	3, 663, 693	1, 738, 398	35. 14	46. 44	21. 32	653, 007	747, 552	9. 25	9. 47
West South Central	165, 013	173, 449	169, 150	4, 959, 433	6, 291, 188	3, 128, 597	30. 05	36. 27	18. 50	782, 469	883, 128	4. 74	5. 09
Mountain	131, 659	117, 337	59, 533	2, 172, 932	3, 163, 188	1, 319, 397	16. 50	26. 96	22. 16	334, 002	361, 476	2. 54	3. 08
Pacific	54, 258	56, 153	51, 329	4, 495, 447	4, 669, 417	2, 478, 146	82. 85	83. 16	48. 28	617, 409	502, 469	11. 38	8. 95
New England:													
Maine	5, 161	5, 426	6, 297	197, 270	204, 109	159, 620	38. 22	37. 62	25. 35	99, 746	89, 697	19. 33	16. 53
New Hampshire	2, 262	2, 604	3, 249	86, 632	89, 996	85, 916	38. 30	34. 56	26. 44	49, 407	42, 570	21. 84	16. 35
Vermont	3, 926	4, 236	4, 664	137, 271	159, 117	112, 588	34. 97	37. 56	24. 14	73, 406	76, 179	18. 70	17. 98
Massachusetts	2, 368	2, 494	2, 876	254, 603	247, 588	194, 169	107. 53	99. 25	67. 51	144, 165	119, 934	60. 89	48. 08
Rhode Island	309	332	443	27, 920	26, 388	27, 933	90. 35	79. 58	63. 01	14, 377	11, 879	46. 52	35. 82
Connecticut	1, 832	1, 899	2, 186	201, 931	190, 271	138, 319	110. 22	100. 20	63. 28	110, 594	89, 084	60. 37	46. 91
Middle Atlantic:													
New York	19, 270	20, 633	22, 030	1, 367, 125	1, 425, 062	1, 184, 746	70. 95	69. 07	53. 78	720, 145	631, 726	37. 38	30. 62
New Jersey	1, 925	2, 283	2, 574	262, 537	250, 324	217, 134	136. 42	109. 67	84. 36	132, 205	108, 142	68. 70	47. 38
Pennsylvania	16, 296	17, 657	18, 587	1, 170, 172	1, 326, 752	1, 041, 069	71. 81	75. 14	56. 01	615, 026	600, 594	37. 74	34. 01
East North Central:													
Ohio	22, 219	23, 516	24, 106	1, 945, 631	2, 661, 436	1, 654, 152	87. 57	113. 18	68. 62	646, 607	646, 323	29. 11	27. 48
Indiana	19, 915	21, 063	21, 300	1, 695, 741	2, 653, 644	1, 594, 276	85. 15	125. 98	74. 85	426, 964	451, 077	21. 44	21. 42
Illinois	30, 732	31, 975	32, 523	4, 199, 459	5, 997, 994	3, 522, 793	136. 65	187. 59	108. 32	773, 004	747, 699	25. 16	23. 38
Michigan	18, 035	19, 033	18, 940	1, 284, 062	1, 436, 686	901, 138	71. 20	75. 48	47. 58	519, 191	477, 500	28. 79	25. 09
Wisconsin	21, 851	22, 148	21, 060	1, 898, 766	2, 187, 882	1, 201, 633	86. 90	98. 78	57. 06	688, 889	568, 969	31. 53	25. 69
West North Central:													
Minnesota	30, 059	30, 222	27, 676	2, 393, 742	3, 301, 168	1, 262, 442	79. 63	109. 23	45. 62	597, 142	550, 840	19. 86	18. 23
Iowa	33, 281	33, 475	33, 931	4, 954, 446	7, 601, 772	3, 257, 379	148. 87	227. 09	96. 00	984, 632	922, 752	29. 59	27. 57
Missouri	32, 642	34, 775	34, 591	2, 003, 286	3, 062, 968	1, 716, 204	61. 37	88. 08	49. 61	440, 561	468, 774	13. 50	13. 48
North Dakota	34, 327	36, 215	28, 426	1, 020, 103	1, 488, 521	822, 657	29. 72	41. 10	28. 94	206, 381	209, 208	6. 02	5. 78
South Dakota	32, 018	34, 636	26, 017	1, 437, 288	2, 472, 894	1, 005, 081	44. 89	71. 40	38. 63	236, 273	241, 462	7. 38	6. 97
Nebraska	42, 025	42, 225	38, 622	2, 524, 074	3, 712, 108	1, 813, 347	60. 06	87. 91	46. 95	398, 282	381, 885	9. 48	9. 04
Kansas	43, 729	45, 425	43, 385	2, 197, 952	2, 830, 064	1, 737, 556	50. 26	62. 30	40. 05	364, 572	354, 429	8. 33	7. 80

TABLE 511.—*Farm land including buildings: Total and per acre value, by geographic divisions and States, 1910, 1920, and 1925*—Continued

Division and State	All land in farms			Total value, including buildings			Value per acre			Buildings only			
										Total value		Value per acre	
	1925	1920	1910	1925	1920	1910	1925	1920	1910	1925	1920	1925	1920
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*Dollars*	*Dollars*	*Dollars*	*1,000 dollars*	*1,000 dollars*	*Dollars*	*Dollars*
South Atlantic:													
Delaware	900	944	1, 039	59, 676	64, 756	53, 156	66. 33	68. 56	51. 17	25, 241	22, 640	28. 44	23. 97
Maryland	4, 433	4, 758	5, 057	341, 361	386, 597	241, 737	77. 00	81. 25	47. 80	134, 087	126, 693	30. 25	26. 63
District of Columbia	3	5	6	4, 795	5, 577	8, 231	1,257.65	984. 01	1,357.64	1, 231	1, 421	322. 94	250. 74
Virginia	17, 210	18, 561	19, 496	886, 814	1, 024, 435	532, 058	51. 53	55. 19	27. 29	286, 138	268, 081	16. 63	14. 44
West Virginia	8, 980	9, 570	10, 026	356, 154	410, 783	264, 391	39. 66	42. 93	26. 37	104, 361	103, 474	11. 62	10. 81
North Carolina	18, 594	20, 022	22, 439	926, 026	1, 076, 393	456, 625	49. 80	53. 76	20. 35	239, 601	218, 578	12. 88	10. 92
South Carolina	10, 639	12, 427	13, 512	457, 622	813, 484	332, 888	43. 01	65. 46	24. 64	110, 536	166, 327	10. 39	13. 38
Georgia	21, 946	25, 441	26, 953	587, 554	1, 138, 299	479, 204	26. 77	44. 74	17. 78	153, 905	240, 854	7. 01	9. 47
Florida	5, 865	6, 047	5, 254	478, 942	281, 449	118, 146	81. 67	46. 55	22. 49	63, 073	53, 024	10. 76	8. 77
East South Central:													
Kentucky	19, 913	21, 613	22, 189	847, 426	1, 305, 159	635, 459	42. 56	60. 39	28. 64	231, 213	254, 406	11. 61	11. 77
Tennessee	17, 901	19, 511	20, 042	759, 427	1, 024, 980	480, 523	42. 42	52. 53	23. 98	203, 483	217, 198	11. 36	11. 13
Alabama	16, 739	19, 577	20, 732	414, 859	543, 657	288, 254	24. 78	27. 77	13. 90	106, 195	127, 894	6. 34	6. 53
Mississippi	16, 054	18, 197	18, 558	459, 118	789, 897	334, 162	28. 60	43. 41	18. 01	112, 116	148, 054	6. 98	8. 14
West South Central:													
Arkansas	15, 632	17, 457	17, 416	540, 727	753, 111	309, 167	34. 59	43. 14	17. 75	119, 992	145, 337	7. 68	8. 33
Louisiana	8, 838	10, 020	10, 440	324, 678	474, 039	237, 545	36. 74	47. 31	22. 75	72, 940	90, 420	8. 25	9. 02
Oklahoma	30, 869	31, 952	28, 859	1, 048, 757	1, 363, 865	738, 677	33. 97	42. 68	25. 60	169, 423	192, 406	5. 48	6. 02
Texas	109, 674	114, 020	112, 435	3, 045, 271	3, 700, 173	1, 843, 208	27. 77	32. 45	16. 39	420, 114	454, 965	3. 83	3. 99
Mountain:													
Montana	32, 736	35, 071	13, 545	455, 395	776, 768	251, 626	13. 91	22. 15	18. 58	65, 881	84, 855	2. 01	2. 42
Idaho	8, 116	8, 376	5, 283	373, 326	581, 512	245, 066	46. 00	69. 43	46. 38	63, 557	69, 646	7. 83	8. 32
Wyoming	18, 663	11, 809	8, 543	172, 676	234, 748	97, 915	9. 25	19. 88	11. 46	24, 508	23, 801	1. 31	2. 02
Colorado	24, 167	24, 462	13, 532	592, 455	866, 014	408, 519	24. 51	35. 40	30. 19	98, 481	102, 291	4. 07	4. 18
New Mexico	27, 850	24, 410	11, 270	174, 917	221, 814	111, 831	6. 28	9. 09	9. 92	22, 884	25, 473	. 82	1. 04
Arizona	11, 065	5, 802	1, 247	144, 014	172, 325	47, 285	13. 01	29. 70	37. 93	17, 226	15, 763	1. 55	2. 72
Utah	5, 001	5, 050	3, 398	192, 201	243, 752	117, 545	38. 43	48. 26	34. 60	32, 499	32, 754	6. 49	6. 49
Nevada	4, 091	2, 357	2, 715	67, 993	66, 255	39, 610	16. 62	28. 11	14. 59	8, 966	6, 893	2. 19	2. 92
Pacific:													
Washington	12, 610	13, 245	11, 712	726, 890	920, 393	571, 968	57. 64	69. 49	48. 84	142, 504	122, 742	11. 30	9. 27
Oregon	14, 131	13, 542	11, 685	616, 069	675, 213	455, 576	43. 60	49. 86	38. 99	110, 928	88, 971	7. 85	6. 57
California	27, 517	29, 366	27, 932	3, 152, 488	3, 073, 811	1, 450, 602	114. 57	104. 67	51. 93	363, 977	290, 756	13. 23	9. 90

Bureau of Agricultural Economics. Compiled from State bulletins, final figures, Bureau of the Census.

TABLE 512.—*Farm real estate: Index numbers of estimated value per acre, by geographic divisions and States, 1912–1927* [1]

[1912-1913-1914=100]

Geographic division and State	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927
United States	97	100	103	103	108	117	129	140	170	157	139	135	130	127	124	119
New England	99	101	100	99	102	112	117	123	140	135	134	130	128	127	128	127
Middle Atlantic	98	100	102	100	104	112	117	121	136	127	118	116	114	114	113	111
East North Central	97	100	103	103	110	116	127	135	161	151	132	128	121	116	111	104
West North Central	97	100	103	105	114	122	134	147	184	174	150	142	132	126	121	115
South Atlantic	98	100	103	98	108	119	135	161	198	174	146	152	151	148	149	137
East South Central	97	100	103	99	109	120	140	162	199	163	149	149	142	141	139	133
West South Central	96	100	104	100	103	116	134	143	177	159	136	132	136	144	144	139
Mountain	98	102	100	98	98	106	117	130	151	133	122	115	110	105	103	101
Pacific	94	99	106	107	111	122	129	134	156	155	151	148	147	146	144	143
New England:																
Maine	100	102	98	96	98	110	115	124	142	132	127	129	127	124	126	124
New Hampshire	97	101	102	101	98	103	111	116	129	123	126	111	109	111	113	112
Vermont	101	101	98	104	115	127	133	136	150	150	145	134	130	125	126	125
Massachusetts	98	109	102	98	100	110	114	119	140	134	134	132	131	132	134	131
Rhode Island	100	101	100	102	106	112	118	123	130	130	127	124	126	128	130	133
Connecticut	98	100	102	100	102	110	116	121	137	134	140	137	140	137	137	138
Middle Atlantic:																
New York	98	100	102	100	103	109	115	118	133	123	116	115	112	111	109	108
New Jersey	98	100	102	100	102	111	115	119	130	130	121	115	120	124	129	128
Pennsylvania	98	100	102	100	105	114	119	124	140	131	120	118	116	114	114	112
East North Central:																
Ohio	98	100	102	107	113	119	131	135	159	134	124	122	118	110	105	99
Indiana	98	100	102	101	110	116	128	135	161	147	119	115	108	102	95	87
Illinois	97	100	103	102	105	111	119	130	160	153	126	123	116	115	109	99
Michigan	98	99	103	105	111	120	134	137	154	152	148	145	138	133	129	127
Wisconsin	97	100	103	104	117	124	133	143	171	168	154	147	139	130	125	122
West North Central:																
Minnesota	95	100	105	107	122	138	155	167	213	212	187	177	170	159	155	145
Iowa	96	99	104	112	128	134	145	160	213	197	162	156	143	136	130	121
Missouri	97	100	103	102	108	115	125	137	167	156	133	127	117	112	104	99
North Dakota	97	100	103	103	112	118	124	130	145	141	136	128	114	109	105	100
South Dakota	96	101	103	101	108	116	126	145	181	173	146	126	117	115	107	97
Nebraska	98	100	102	101	104	110	127	145	179	166	144	139	128	123	123	119
Kansas	101	99	99	103	109	115	122	132	151	149	130	127	118	115	113	113
South Atlantic:																
Delaware	100	101	99	100	105	115	124	129	139	129	119	119	107	112	114	111
Maryland	97	100	103	104	109	118	129	136	166	146	141	136	133	131	130	126
Virginia	97	100	103	97	117	125	142	167	189	180	157	170	162	154	148	138
West Virginia	97	100	103	101	104	112	122	135	154	141	125	127	125	120	116	110
North Carolina	97	99	104	102	114	130	152	176	223	196	166	195	192	187	185	178
South Carolina	101	98	101	94	98	107	122	162	230	186	126	128	136	138	128	113
Georgia	98	101	101	94	105	116	131	172	217	172	136	125	123	116	112	104
Florida	96	99	105	97	103	109	126	143	178	176	157	155	163	172	223	183
East South Central:																
Kentucky	97	100	103	100	111	127	146	170	200	172	151	147	141	140	139	134
Tennessee	96	100	104	100	110	121	145	168	200	169	154	158	148	137	134	130
Alabama	98	98	103	98	98	103	128	143	177	147	135	143	144	154	154	145
Mississippi	97	102	102	97	111	121	131	155	218	150	148	143	134	136	134	126
West South Central:																
Arkansas	98	101	101	95	100	129	149	169	222	186	174	170	160	160	153	150
Louisiana	99	102	99	95	106	112	143	157	198	163	140	144	137	141	143	135
Oklahoma	98	101	101	95	104	114	130	140	166	160	139	133	125	131	130	128
Texas	95	100	105	103	103	115	133	141	174	156	133	128	137	146	146	141
Mountain:																
Montana	97	100	103	100	94	100	106	114	126	105	96	87	81	75	72	70
Idaho	100	101	99	96	99	114	130	146	172	162	136	133	129	123	119	117
Wyoming	97	103	100	103	94	97	121	147	176	146	134	121	112	100	95	94
Colorado	98	103	98	93	102	107	110	118	141	132	123	113	98	92	89	82
New Mexico	100	101	96	100	96	111	118	127	144	125	115	110	110	108	106	108
Arizona	95	100	105	97	95	105	125	140	165	148	135	124	128	121	125	123
Utah	100	102	98	98	104	117	122	144	167	137	133	133	131	130	129	128
Nevada	96	100	103	102	99	96	103	117	135	123	119	112	108	102	99	99
Pacific:																
Washington	98	100	103	100	102	112	118	122	140	132	124	117	115	113	112	111
Oregon	97	100	103	99	100	104	112	118	130	130	122	115	113	110	107	106
California	93	99	108	111	116	130	136	142	167	168	166	165	164	164	163	162

Bureau of Agricultural Economics. Based on values as reported by crop reporters.

[1] All farm land with improvements as of Mar. 1.

TABLE 513.—*Number of farms per 1,000 changing ownership by various methods, by States and geographic divisions, 12 months ended March 15, 1926 and 1927, and bankruptcy among farmers, cases concluded years ended June 30, 1922–1926*

Geographic division and State	Voluntary sales and trades [1]		Forced sales and related defaults: Delinquent taxes		Forced sales and related defaults: Foreclosure of mortgage, bankruptcy, etc.[2]		Forced sales and related defaults: Total		Inheritance and gift		Administrators' and executors' sales, 1927 [3]	Miscellaneous and unclassified		Total all classes: Excluding administrators' and executors' sales		Total all classes: Including administrators' and executors' sales, 1927	Bankruptcies, number					
	1926	1927	1926	1927	1926	1927	1926	1927	1926	1927		1926	1927	1926	1927		1922	1923	1924	1925	1926	1927
United States	29.6	28.3	4.1	5.0	17.3	17.8	21.4	22.8	7.1	8.2	6.9	2.2	1.1	60.3	60.4	67.3	3,236	5,940	7,772	7,872	7,769	6,296
Geographic divisions:																						
New England	34.0	32.4	4.5	3.9	9.2	8.2	13.7	12.1	6.7	7.8	7.2	1.9	.7	56.3	53.0	60.2	92	146	196	169	145	105
Middle Atlantic	35.4	37.0	2.9	2.9	8.7	8.8	11.6	11.7	6.9	8.2	8.7	2.5	1.5	56.4	58.4	67.1	77	148	171	190	224	224
East North Central	25.8	25.8	3.2	3.8	15.7	16.6	18.9	20.4	7.3	9.2	9.1	2.0	1.4	54.0	56.8	65.9	247	569	684	760	844	719
West North Central	23.0	24.3	4.2	5.2	26.5	26.4	30.7	31.6	7.4	7.9	6.4	2.5	1.3	63.6	65.1	71.5	1,066	2,005	2,785	2,889	2,813	2,404
South Atlantic	28.0	24.2	5.4	6.8	13.4	13.1	18.8	19.9	8.4	9.8	7.6	2.0	.9	57.2	54.8	63.4	678	959	1,085	1,037	747	585
East South Central	33.5	29.3	3.8	5.8	12.4	15.9	16.2	21.7	7.6	8.7	7.5	1.8	.8	59.1	60.5	68.0	201	420	483	517	579	615
West South Central	34.7	31.1	3.4	3.8	15.2	16.1	18.6	19.9	6.0	6.8	4.3	2.2	.7	61.5	58.5	62.8	264	539	788	650	764	567
Mountain	32.0	33.7	9.8	9.0	40.4	36.0	50.2	45.0	4.3	5.7	4.4	3.5	2.3	90.0	86.7	91.1	419	730	1,040	1,071	1,142	609
Pacific	35.6	36.3	3.5	3.8	16.3	15.7	19.8	19.5	5.1	5.8	3.9	3.3	1.4	63.8	63.0	66.9	192	424	540	589	511	468
New England:																						
Maine	31.7	32.8	6.7	6.0	11.1	10.5	17.8	16.5	6.3	7.0	6.5	2.5	.6	58.3	56.9	63.4	51	94	136	103	101	51
New Hampshire	34.4	33.5	6.1	5.0	6.9	6.6	13.0	11.6	7.4	8.4	6.0	1.9	.4	56.7	53.9	59.9	7	12	6	5	7	7
Vermont	46.0	42.6	1.3	1.7	11.9	10.8	13.2	12.5	6.8	8.6	9.5	1.9	1.0	67.9	64.7	74.2	21	20	27	39	17	21
Massachusetts	31.3	28.0	2.1	2.0	4.9	4.5	7.0	6.5	6.6	8.3	6.8	1.4	.3	46.3	43.1	49.9	10	5	11	7	12	10
Rhode Island	39.6	37.0	6.9	4.0	9.3	6.5	16.2	10.5	9.9	9.0	8.0	4.2	0.0	69.9	54.5	62.5	1	------	1	2	------	2
Connecticut	27.1	23.9	5.2	3.0	9.9	6.0	15.1	9.0	6.2	7.0	7.8	1.0	1.5	49.4	41.4	49.2	2	15	15	13	8	14
Middle Atlantic:																						
New York	33.4	37.5	4.1	3.9	10.8	12.7	14.9	16.6	6.7	8.7	8.0	2.7	1.8	57.7	64.6	72.6	38	96	105	104	122	145
New Jersey	59.4	54.4	1.7	2.0	7.8	6.0	9.5	8.0	7.5	7.0	6.8	.6	.4	77.0	69.8	76.6	4	4	14	16	33	16
Pennsylvania	33.7	34.0	1.9	2.1	7.0	5.6	8.9	7.7	7.0	7.6	9.6	2.5	1.3	52.1	50.6	60.2	35	48	52	70	69	63
East North Central:																						
Ohio	29.8	30.8	1.6	2.1	11.2	11.5	12.8	13.6	8.1	9.0	9.7	2.3	1.2	53.0	54.6	64.3	64	156	209	214	188	137
Indiana	26.8	25.8	4.2	5.4	14.0	16.9	18.2	22.3	8.0	10.0	10.5	2.2	1.0	55.2	59.1	69.6	59	84	101	97	112	76
Illinois	22.3	21.7	1.4	1.8	15.7	16.8	17.1	18.6	7.5	10.4	11.0	1.2	1.4	48.1	52.1	63.1	81	192	194	190	234	257
Michigan	30.8	30.5	4.6	6.4	16.6	18.8	21.2	25.2	6.9	9.8	7.9	1.7	1.2	60.6	66.7	74.6	11	27	44	46	50	34
Wisconsin	18.9	19.8	4.8	4.0	22.4	20.5	27.2	24.5	5.7	6.9	5.8	2.7	2.0	54.5	53.2	59.0	32	110	136	213	260	215
West North Central:																						
Minnesota	18.0	18.5	3.8	4.5	26.8	24.7	30.6	29.2	6.7	6.7	5.3	2.6	1.7	57.9	56.1	61.4	189	291	430	369	419	294
Iowa	15.5	18.7	2.6	2.5	26.9	27.3	29.5	29.8	7.4	8.0	7.0	2.0	1.2	54.4	57.7	64.7	368	489	663	861	791	656
Missouri	29.9	29.9	2.4	4.0	21.4	21.7	23.8	25.7	8.5	9.5	6.6	3.1	1.1	65.3	66.2	72.8	61	105	238	287	301	314
North Dakota	23.9	23.9	12.7	18.1	46.3	43.0	59.0	61.1	6.7	6.5	5.1	2.2	1.0	91.8	92.5	97.6	237	615	782	629	536	376

South Dakota	16.7	29.8	13.6	15.0	52.5	51.1	66.1	66.1	8.6	8.0	5.5	1.6	1.3	93.0	96.2	101.7	38	148	236	352	368	352
Nebraska	23.4	26.2	2.2	3.2	21.9	25.3	24.1	28.5	6.3	7.0	6.8	2.6	1.4	56.4	63.1	69.9	60	132	172	178	238	181
Kansas	29.7	29.6	2.4	2.5	15.8	16.0	15.2	19.5	7.3	8.1	7.2	2.5	1.2	57.7	57.4	64.6	113	225	264	213	160	231
South Atlantic:																						
Delaware	22.7	20.9	2.5	2.5	10.3	10.0	12.8	12.5	5.5	7.5	8.0	0.0	.5	41.0	41.4	49.4	3	2	6	8	5	4
Maryland	32.3	30.0	4.7	5.0	9.5	10.3	14.2	15.3	7.8	9.4	9.2	1.4	.6	55.7	55.3	64.5	17	37	42	38	54	35
Virginia	23.2	19.3	3.2	2.5	13.8	11.8	17.0	14.3	10.6	10.2	6.8	2.0	.3	52.8	44.1	50.9	40	87	84	95	111	97
West Virginia	30.1	28.2	6.0	8.4	8.4	7.8	14.4	16.2	9.7	12.8	6.8	2.2	1.6	56.4	58.8	65.6	12	7	11	19	10	16
North Carolina	25.0	21.3	5.9	8.6	7.3	10.0	13.2	18.6	6.9	10.1	8.8	1.9	1.6	47.0	51.6	60.4	13	16	36	45	37	50
South Carolina	18.0	14.7	5.2	8.1	20.4	19.4	25.6	27.5	8.4	8.0	7.0	2.3	.4	54.3	50.6	57.6	1	24	36	26	53	47
Georgia	25.3	24.0	6.5	8.2	22.3	19.7	28.9	27.9	9.0	10.7	9.0	2.5	.8	65.7	63.4	72.4	588	772	848	798	467	327
Florida	81.0	63.5	7.2	6.6	8.9	8.5	16.1	15.1	4.6	4.3	3.0	0.0	.5	101.7	83.4	86.4	4	14	22	8	10	9
East South Central:																						
Kentucky	35.3	31.0	4.9	7.5	12.2	16.1	16.2	23.6	8.4	9.3	8.0	2.1	1.0	62.0	64.9	72.9	43	88	104	108	117	164
Tennessee	22.1	25.3	2.7	4.5	13.3	15.3	16.0	19.8	6.9	7.4	7.7	1.9	.8	53.9	53.3	61.0	46	118	112	109	134	101
Alabama	35.5	30.3	1.8	1.5	11.2	14.2	13.0	15.7	7.1	9.2	6.6	1.0	.3	56.6	55.5	62.1	100	181	218	242	295	318
Mississippi	34.6	30.9	7.1	10.4	12.9	18.7	20.0	29.1	8.0	9.0	7.4	2.2	.9	64.8	69.9	77.3	12	33	49	58	33	32
West South Central:																						
Arkansas	42.6	38.2	2.9	3.0	17.8	19.9	20.7	22.9	8.1	7.4	3.5	1.7	.6	73.1	69.1	72.6	72	76	104	85	101	94
Louisiana	31.6	29.4	5.3	4.8	17.5	16.1	22.8	20.9	7.0	7.1	8.0	2.2	.9	63.6	58.3	66.3	32	129	171	77	159	119
Oklahoma	33.7	29.0	6.6	8.2	24.1	24.2	30.7	32.4	4.5	5.5	4.1	2.9	.9	71.8	67.8	71.9	38	81	138	145	170	145
Texas	32.4	29.4	1.6	1.8	9.3	10.5	10.9	12.3	5.5	7.0	3.8	2.0	.6	50.8	49.3	53.1	122	253	375	343	334	209
Mountain:																						
Montana	30.1	35.2	10.1	11.0	60.8	56.0	70.9	67.0	3.7	5.7	5.2	2.8	2.5	107.5	110.4	115.6	215	366	551	460	624	245
Idaho	27.7	26.5	7.8	7.3	39.6	32.6	47.4	39.9	4.6	5.1	3.2	2.6	2.3	82.3	73.8	77.0	79	160	231	260	223	161
Wyoming	28.2	32.2	14.5	13.7	27.9	25.6	42.4	39.3	2.4	5.0	4.3	3.4	3.0	76.4	79.5	83.8	12	14	36	48	38	31
Colorado	33.9	35.7	13.7	10.2	43.3	36.3	57.0	46.5	4.8	6.8	5.3	3.9	1.6	99.6	90.6	95.9	77	118	128	220	143	90
New Mexico	49.2	50.1	4.1	5.4	33.7	30.3	37.8	35.7	4.6	5.6	3.9	6.4	3.9	98.0	95.3	99.2	3	3	28	27	50	22
Arizona	26.9	30.0	5.8	5.5	48.1	40.3	53.9	45.8	3.0	5.8	3.8	5.8	3.2	89.6	84.8	88.6	9	37	31	19	29	30
Utah	23.0	22.0	10.9	9.5	12.5	16.0	23.4	25.5	4.9	5.0	4.1	1.1	1.4	52.4	53.9	58.0	22	32	35	32	33	26
Nevada	20.8	22.8	0.0	2.0	30.9	24.6	30.9	26.6	3.3	3.5	3.0	3.7	1.0	58.7	54.9	57.9	2	------	0	5	2	4
Pacific:																						
Washington	34.8	35.7	6.7	7.7	21.0	20.3	27.7	28.0	5.8	6.4	4.2	2.5	1.5	70.8	71.6	75.8	49	131	213	196	182	160
Oregon	29.7	34.1	2.6	3.2	15.2	16.0	17.8	19.2	4.9	5.9	5.0	3.0	1.3	55.4	60.5	65.5	33	110	91	100	109	72
California	38.5	37.5	2.1	2.0	14.2	13.0	16.3	15.0	4.9	5.5	3.3	3.9	1.4	63.6	59.4	62.7	110	183	236	293	220	236

Bureau of Agricultural Economics. Bankruptcy figures compiled from reports of Attorney General.

[1] Including contracts to purchase (but not options).

[2] Including loss of title by default of contract, sales to avoid foreclosures, and surrender of title or other transfers to avoid foreclosure.

[3] Including all other sales in settlement of estate.

TABLE 514.—*Farm population, by age, color, and tenure, 1925*

Division and State	All farm population		Population on owned farms					Population on tenant farms					Population on managed farms		
	Total	Under 10 years of age	Total	Under 10 years of age	10 years of age and over			Total	Under 10 years of age	10 years of age and over			Total	White	Colored
					Total	White	Colored			Total	White	Colored			
New England	657, 755	130, 429	600, 382	115, 474	484, 908	483, 937	971	40, 719	11, 328	29, 391	29, 302	89	16, 654	16, 501	153
Maine	191, 062	38, 807	181, 666	35, 980	145, 686	145, 583	103	7, 463	2, 331	5, 132	5, 129	3	1, 933	1, 933	-------
New Hampshire	77, 450	13, 322	72, 041	11, 959	60, 082	60, 056	26	4, 463	1, 181	3, 282	3, 279	3	946	946	-------
Vermont	114, 188	23, 850	99, 853	19, 800	80, 053	80, 014	39	12, 423	3, 569	8, 854	8, 843	11	1, 912	1, 908	4
Massachusetts	149, 238	28, 203	135, 925	25, 405	110, 520	110, 033	487	6, 813	1, 623	5, 190	5, 168	22	6, 500	6, 469	31
Rhode Island	18, 663	3, 502	15, 166	2, 648	12, 518	12, 419	99	2, 482	661	1, 821	1, 806	15	1, 015	991	24
Connecticut	107, 154	22, 745	95, 731	19, 682	76, 049	75, 832	217	7, 075	1, 963	5, 112	5, 077	35	4, 348	4, 254	94
Middle Atlantic	1, 817, 602	388, 471	1, 472, 490	294, 443	1, 178, 047	1, 171, 287	6, 760	315, 857	86, 946	228, 911	227, 115	1, 796	29, 255	28, 726	529
New York	767, 500	152, 605	633, 395	118, 777	514, 618	512, 070	2, 548	119, 846	30, 736	89, 110	88, 746	364	14, 259	14, 146	113
New Jersey	139, 255	27, 040	111, 981	20, 530	91, 451	89, 331	2, 120	23, 628	5, 638	17, 990	17, 265	725	3, 646	3, 429	217
Pennsylvania	910, 847	208, 826	727, 114	155, 136	571, 978	569, 886	2, 092	172, 383	50, 572	121, 811	121, 104	707	11, 350	11, 151	199
East North Central	4, 511, 148	1, 015, 798	3, 238, 969	652, 342	2, 586, 627	2, 576, 403	10, 224	1, 233, 737	353, 306	880, 431	875, 338	5, 093	38, 442	36. 051	2, 391
Ohio	1, 031, 718	229, 397	735, 050	136, 379	598, 671	594, 778	3, 893	289, 675	82, 273	207, 402	205, 786	1, 616	6, 993	6, 842	151
Indiana	798, 157	169, 302	539, 493	96, 470	443, 023	441, 814	1, 209	252, 038	71, 060	180, 978	180, 391	587	6, 626	6, 560	66
Illinois	996, 368	226, 724	556, 160	102, 921	453, 239	450, 997	2, 242	429, 824	120, 964	308, 860	306, 350	2, 510	10, 384	10, 330	54
Michigan	791, 553	181, 044	656, 278	141, 068	515, 210	513, 587	1, 623	128, 755	38, 232	90, 523	90, 288	235	6, 520	6, 478	42
Wisconsin	893, 352	218, 331	751, 988	175, 504	576, 484	575, 227	1, 257	133, 445	40, 777	92, 668	92, 523	145	7, 919	5, 841	2, 078
West North Central	4, 924, 437	1, 218, 867	3, 075, 752	653, 270	2, 422, 482	2, 403, 426	19, 056	1, 818, 973	557, 407	1, 261, 566	1, 241, 077	20, 489	29, 712	27, 648	2, 064
Minnesota	875, 749	214, 964	638, 066	140, 682	497, 384	495, 817	1, 567	233, 952	73, 286	160, 666	160, 512	154	3, 731	3, 720	11
Iowa	951, 558	235, 168	523, 592	103, 661	419, 931	419, 639	292	419, 559	129, 132	290, 427	290, 257	170	8, 407	8, 392	15
Missouri	1, 094, 027	251, 022	715, 488	141, 454	574, 034	567, 844	6, 190	373, 038	108, 058	264, 980	247, 821	17, 159	5, 511	5, 296	215
North Dakota	372, 886	104, 142	253, 671	64, 211	189, 460	187, 463	1, 997	117, 457	39, 522	77, 935	77, 364	571	1, 758	1, 755	3
South Dakota	361, 779	98, 807	218, 920	52, 804	166, 116	159, 744	6, 372	140, 693	45, 398	95, 295	94, 389	906	2, 166	1, 629	537
Nebraska	566, 660	146, 850	316, 593	69, 251	247, 342	247, 020	322	245, 455	76, 353	169, 102	168, 773	329	4, 612	3, 360	1, 252
Kansas	701, 768	167, 864	409, 422	81, 207	328, 215	325, 899	2, 316	288, 819	85, 658	203, 161	201, 961	1, 200	3, 527	3, 496	31
South Atlantic	5, 660, 560	1, 603, 758	3. 101, 460	752, 283	2, 319, 177	1, 841, 418	477, 759	2, 496. 398	803, 102	1, 693, 296	839, 766	853, 530	62, 702	36, 329	26, 373
Delaware	44, 662	9, 625	26, 547	5, 039	21, 508	19, 558	1, 950	17, 485	4, 433	13, 052	10, 756	2, 296	630	523	107
Maryland	249, 319	59, 202	170, 148	36, 530	133, 618	112, 486	21, 132	71, 750	20, 457	51, 293	38, 453	12, 840	7, 421	5, 933	1, 488
District of Columbia	682	127	359	67	292	257	35	165	38	127	117	10	158	143	15

Virginia	959, 162	281, 433	723, 897	177, 889	546, 008	408, 166	137, 842	245, 183	80, 314	164, 869	103, 215	61, 654	11, 052	8, 625	2, 454
West Virginia	455, 204	116, 669	572, 249	92, 655	279, 587	277, 089	2, 507	78, 353	25, 823	53, 020	52, 184	836	4, 111	4, 014	67
North Carolina	1, 446, 851	431, 355	792, 003	212, 119	584, 484	484, 712	99, 772	646, 642	218, 127	428, 505	213, 574	214, 931	3, 636	2, 487	1, 129
South Carolina	911, 555	276, 662	335, 194	99, 967	244, 297	146, 978	97, 229	570, 967	153, 386	387, 551	120, 775	208, 566	5, 724	1, 839	3, 885
Georgia	1, 302, 584	379, 524	452, 727	119, 032	353, 695	278, 688	85, 607	806, 426	251, 895	554, 531	278, 120	276, 411	20, 451	7, 341	13, 000
Florida	262, 151	64, 351	158, 745	47, 967	145, 778	113, 493	32, 285	58, 927	18, 669	40, 318	22, 572	17, 746	9, 569	5, 391	4, 118
East South Central	4, 631, 856	1, 262, 644	2, 365, 632	573, 119	1, 795, 513	1, 583, 625	211, 855	2, 251, 255	686, 354	1, 564, 901	831, 105	733, 796	11, 969	7, 811	4, 158
Kentucky	1, 163, 061	312, 333	765, 275	193, 552	601, 723	580, 389	21, 334	365, 848	118, 328	247, 520	229, 719	17, 801	1, 878	1, 520	358
Tennessee	1, 173, 316	312, 489	704, 737	165, 923	538, 814	499, 261	39, 553	465, 841	145, 776	320, 065	237, 921	82, 144	2, 738	2, 257	481
Alabama	1, 166, 432	328, 733	475, 330	117, 492	357, 838	288, 591	69, 247	687, 079	210, 184	476, 895	232, 263	244, 632	4, 023	2, 016	2, 037
Mississippi	1, 129, 107	309, 039	393, 290	96, 152	297, 138	215, 384	81, 754	732, 487	212, 066	520, 421	131, 202	389, 219	3, 330	2, 018	1, 312
West South Central	4, 736, 241	1, 290, 607	1, 992, 367	464, 263	1, 528, 104	1, 311, 615	216, 489	2, 704, 200	815, 341	1, 888, 859	1, 337, 997	550, 862	39, 674	22, 915	16, 759
Arkansas	999, 840	272, 789	452, 597	110, 302	342, 295	296, 847	45, 448	542, 677	161, 339	381, 338	225, 730	155, 608	4, 566	2, 875	1, 691
Louisiana	696, 179	201, 353	301, 757	78, 488	223, 269	167, 289	55, 980	372, 634	116, 656	255, 978	96, 852	159, 126	21, 788	8, 751	13, 037
Oklahoma	925, 690	255, 240	376, 802	86, 248	290, 554	259, 334	31, 220	545, 735	168, 034	377, 701	339, 044	38, 657	3, 153	2, 773	380
Texas	2, 114, 532	561, 195	861, 211	189, 225	671, 986	588, 145	83, 841	1, 243, 154	369, 312	873, 842	676, 371	197, 471	10, 167	8, 516	1, 651
Mountain	1, 012, 100	266, 911	742, 097	186, 140	555, 957	543, 390	12, 567	224, 483	69, 721	154, 762	150, 836	3, 926	45, 520	13, 865	31, 655
Montana	182, 885	47, 282	137, 267	33, 617	103, 650	100, 354	3, 296	41, 566	12, 733	28, 833	28, 623	210	4, 052	1, 818	2, 234
Idaho	172, 216	46, 142	126, 851	31, 543	95, 308	93, 631	1, 677	42, 433	13, 810	28, 623	28, 147	476	2, 932	2, 054	878
Wyoming	61, 181	15, 041	48, 471	11, 449	37, 022	36, 521	501	11, 327	3, 388	7, 939	7, 896	43	1, 383	1, 379	4
Colorado	250, 492	64, 159	166, 073	38, 547	127, 526	126, 677	849	80, 852	24, 722	56, 130	55, 105	1, 025	3, 567	3, 368	199
New Mexico	147, 482	40, 708	113, 232	30, 898	82, 334	80, 456	1, 878	22, 922	7, 058	15, 864	15, 504	360	11, 328	1, 638	9, 690
Arizona	71, 954	18, 615	38, 669	9, 742	28, 927	26, 234	2, 693	13, 254	3, 888	9, 366	7, 988	1, 378	20, 031	2, 328	17, 703
Utah	108, 856	31, 256	97, 130	27, 249	69, 881	69, 161	720	10, 798	3, 770	7, 028	6, 642	386	928	392	536
Nevada	17, 034	3, 678	14, 404	3, 095	11, 309	10, 356	953	1, 331	352	979	931	48	1, 299	888	411
Pacific	1, 029, 969	216, 956	794, 243	154, 091	640, 152	624, 885	15, 267	180, 638	49, 359	131, 279	120, 913	10, 366	55, 088	40, 758	14, 330
Washington	288, 673	60, 830	230, 924	44, 410	186, 514	184, 003	2, 511	51, 692	14, 824	36, 868	35, 458	1, 410	6, 057	4, 218	1, 839
Oregon	210, 288	43, 348	168, 315	32, 019	136, 296	134, 740	1, 556	38, 993	10, 647	28, 346	27, 591	755	2, 980	2, 939	41
California	531, 008	112, 778	395, 004	77, 662	317, 342	306, 142	11, 200	89, 953	23, 888	66, 065	57, 864	8, 201	46, 051	33, 601	12, 450
United States	28, 981, 668	7, 394, 441	17, 386, 392	3, 875, 425	13, 510, 967	12, 539, 986	970, 981	11, 266, 260	3, 432, 864	7, 833, 396	5, 653, 449	2, 179, 947	329, 016	230, 604	98, 412

Bureau of the Census.

TABLE 515.—*Farm population* [1] *of the United States, 1910, 1920–1927, by years*

Year		Number	Year		Number
1910 (estimated)		31, 400, 000	1924 (estimated)		29, 400, 000
1920 (estimated)		31, 000, 000	1925 (Census of 1925)		28, 981, 668
1921 (estimated)		30, 600, 000	1926 (estimated)		28, 502, 000
1922 (estimated)		30, 200, 000	1927 (estimated)		27, 853, 000
1923 (estimated)		29, 800, 000			

Bureau of the Census.

[1] Farm population, as here used, is in accord with the definition in the 1925 Census of Agriculture—namely "all persons living on farms."

TABLE 516.—*Farm population by States, 1910 (estimated), 1920, and 1925*

State	Estimated farm population 1910 [1]	Farm population 1920 as enumerated [1]	Farm population 1925 as enumerated [1]	Percent of gain or loss [2]		Farm population per farm		
				1910–1920	1920–1925	1910	1920	1925
	Number	*Number*	*Number*	*Per cent*	*Per cent*	*Number*	*Number*	*Number*
Maine	246, 984	197, 601	191, 062	−20. 0	−3. 3	4. 12	4. 10	3. 82
New Hampshire	101, 503	76, 021	77, 450	−25. 1	1. 9	3. 75	3. 70	2. 68
Vermont	142, 372	125, 263	114, 188	−12. 0	−8. 8	4. 35	4. 31	4. 11
Massachusetts	140, 413	118, 554	149, 238	−15. 6	25. 9	3. 80	3. 70	4. 46
Rhode Island	20, 297	15, 136	18, 663	−25. 4	23. 3	3. 84	3. 71	4. 77
Connecticut	112, 124	93, 302	107, 154	−16. 8	14. 8	4. 18	4. 12	4. 61
New York	921, 656	800, 747	767, 500	−13. 1	−4. 2	4. 27	4. 14	4. 07
New Jersey	165, 456	143, 708	139, 255	−13. 1	−3. 1	4. 94	4. 84	4. 60
Pennsylvania	1, 050, 050	948, 334	910, 847	−9. 7	−4. 0	4. 79	4. 69	4. 54
Ohio	1, 244, 769	1, 139, 329	1, 031, 718	−8. 5	−9. 4	4. 58	4. 44	4. 22
Indiana	997, 243	907, 295	798, 157	−9. 0	−12. 0	4. 63	4. 42	4. 08
Illinois	1, 219, 237	1, 098, 262	996, 368	−9. 9	−9. 3	4. 84	4. 63	4. 42
Michigan	911, 555	848, 710	791, 553	−6. 9	−6. 7	4. 40	4. 32	4. 12
Wisconsin	902, 303	920, 037	893, 352	2. 0	−2. 9	5. 09	4. 86	4. 62
Minnesota	833, 131	897, 181	875, 749	7. 7	−2. 4	5. 34	5. 03	4. 65
Iowa	1, 052, 815	984, 799	951, 558	−6. 5	−3. 4	4. 85	4. 61	4. 46
Missouri	1, 351, 509	1, 211, 346	1, 094, 037	−10. 4	−9. 7	4. 87	4. 61	4. 20
North Dakota	369, 212	394, 500	372, 886	6. 8	−5. 5	4. 97	5. 08	4. 91
South Dakota	370, 820	362, 221	361, 779	−2. 3	. 1	4. 78	4. 85	4. 55
Nebraska	631, 467	584, 172	566, 660	−7. 5	−3. 0	4. 87	4. 70	4. 44
Kansas	830, 197	737, 377	701, 768	−11. 2	−4. 8	4. 67	4. 46	4. 23
Delaware	58, 355	51, 212	44, 662	−12. 2	−12. 8	5. 39	5. 05	4. 35
Maryland	297, 432	279, 225	249, 319	−6. 1	−10. 7	6. 08	5. 83	5. 09
District of Columbia	951	894	682	−6. 0	−23. 7	4. 38	4. 38	4. 91
Virginia	1, 065, 059	1, 064, 417	980, 162	−. 1	−7. 9	5. 79	5. 72	5. 06
West Virginia	543, 766	477, 924	455, 204	−12. 1	−4. 8	5. 62	5. 48	5. 04
North Carolina	1, 408, 580	1, 501, 227	1, 446, 881	6. 6	−3. 6	5. 55	5. 56	5. 10
South Carolina	970, 334	1, 074, 693	911, 885	10. 8	−15. 1	5. 50	5. 58	5. 28
Georgia	1, 593, 809	1, 685, 213	1, 309, 585	5. 7	−22. 3	5. 48	5. 42	5. 26
Florida	273, 397	281, 893	262, 181	3. 1	−7. 0	5. 47	5. 22	4. 43
Kentucky	1, 285, 920	1, 304, 862	1, 163, 001	1. 5	−10. 9	4. 96	4. 82	4. 50
Tennessee	1, 278, 032	1, 271, 708	1, 173, 316	−. 5	−7. 7	5. 19	5. 03	4. 64
Alabama	1, 382, 754	1, 335, 885	1, 166, 432	−3. 4	−12. 7	5. 26	5. 22	4. 91
Mississippi	1, 344, 307	1, 270, 482	1, 129, 107	−5. 5	−11. 1	4. 90	4. 67	4. 39
Arkansas	1, 106, 815	1, 147, 049	999, 840	3. 6	−12. 8	5. 16	4. 93	4. 50
Louisiana	732, 016	786, 050	696, 179	7. 4	−11. 4	6. 07	5. 80	5. 26
Oklahoma	1, 022, 016	1, 017, 327	925, 690	−. 5	9. 0	5. 37	5. 30	4. 69
Texas	2, 293, 474	2, 277, 773	2, 114, 532	−. 7	−7. 2	5. 49	5. 22	4. 54
Montana	111, 273	225, 667	182, 885	102. 8	−19. 0	4. 24	3. 91	3. 90
Idaho	147, 636	200, 902	172, 216	36. 1	−14. 3	4. 79	4. 77	4. 24
Wyoming	52, 264	67, 306	61, 181	28. 8	−9. 1	4. 76	4. 27	3. 91
Colorado	202, 857	266, 073	250, 492	31. 2	−5. 9	4. 39	4. 44	4. 32
New Mexico	183, 539	161, 446	147, 482	−12. 0	−8. 6	5. 14	5. 41	4. 65
Arizona	84, 509	90, 560	71, 954	7. 0	−20. 5	9. 17	9. 08	6. 66
Utah	122, 255	140, 249	108, 856	14. 7	−22. 4	5. 64	5. 47	4. 19
Nevada	13, 321	16, 164	17, 034	21. 3	5. 4	4. 95	5. 11	4. 39
Washington	259, 989	283, 382	288, 673	9. 0	1. 9	4. 63	4. 28	3. 94
Oregon	210, 128	214, 021	210, 288	1. 9	−1. 7	4. 62	4. 26	3. 76
California	416, 969	516, 770	531, 008	23. 9	2. 8	4. 73	4. 39	3. 89
United States	32, 076, 960	31, 614, 269	28, 981, 668	−1. 4	−8. 3	5. 04	4. 90	4. 55

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[1] The farm population, as reported for 1925, comprises all persons living on farms. As reported for 1920, farm population included not only all persons living on farms, but in addition those farm laborers and their families who, while not living on farms, did live outside any incorporated place. The number thus included is believed to be relatively small. The estimated farm population for 1910 is comparable with that of 1920.

[2] A minus sign (—) denotes decrease.

TABLE 517.—*Rural population, by States, by decades, 1880 to 1920*

State	1920	1910	1900	1890	1880	Percentage of gain or loss[1]			
						1910–1920	1900–1910	1890–1900	1880–1890
Maine	468, 415	480, 123	461, 639	487, 305	502, 328	−2. 4	4. 0	−5. 3	−3. 0
New Hampshire	163, 322	175, 473	185, 319	184, 051	211, 977	−6. 9	−5. 3	. 7	−13. 2
Vermont	242, 452	257, 039	267, 810	281, 784	302, 755	−5. 7	−4. 0	−5. 0	−6. 9
Massachusetts	202, 108	241, 049	238, 248	235, 093	269, 773	−16. 2	1. 2	1. 3	−12. 9
Rhode Island	15, 217	17, 956	20, 909	18, 901	18, 004	−15. 3	−14. 1	10. 6	5. 0
Connecticut	444, 292	382, 959	364, 665	353, 713	377, 146	16. 0	5. 0	3. 1	−6. 2
New York	1, 795, 383	1, 928, 120	1, 970, 783	2, 103, 437	2, 230, 861	−6. 9	−2. 2	−6. 3	−5. 7
New Jersey	680, 961	629, 957	554, 507	568, 295	523, 930	8. 1	13. 6	−2. 4	8. 5
Pennsylvania	3, 112, 202	3, 034, 442	2, 853, 505	2, 700, 716	2, 499, 513	2. 6	6. 3	5. 7	8. 0
Ohio	2, 082, 258	2, 101, 978	2, 159, 163	2, 167, 939	2, 167, 293	−. 9	−2. 6	−. 4	(2)
Indiana	1, 447, 535	1, 557, 041	1, 650, 773	1, 602, 365	1, 592, 090	−7. 0	−5. 8	3. 2	. 6
Illinois	2, 082, 127	2, 161, 662	2, 205, 182	2, 116, 180	2, 137, 367	−3. 7	−2. 0	4. 2	−1. 0
Michigan	1, 426, 852	1, 483, 129	1, 468, 659	1, 363, 596	1, 231, 525	−3. 8	1. 0	7. 7	10. 7
Wisconsin	1, 387, 499	1, 329, 540	1, 278, 829	1, 131, 044	1, 001, 262	4. 4	4. 0	13. 1	13. 0
Minnesota	1, 335, 532	1, 225, 414	1, 153, 294	867, 234	632, 853	9. 0	6. 3	33. 0	37. 0
Iowa	1, 528, 526	1, 544, 717	1, 659, 467	1, 506, 533	1, 377, 188	−1. 0	−6. 9	10. 2	9. 4
Missouri	1, 817, 152	1, 891, 518	1, 978, 561	1, 822, 219	1, 622, 387	−4. 1	−4. 2	8. 6	12. 3
North Dakota	558, 633	513, 820	295, 733	180, 340	34, 216	8. 7	73. 7	64. 0	427. 1
South Dakota	534, 675	507, 215	360, 634	320, 015	91, 060	5. 4	40. 6	12. 7	251. 5
Nebraska	891, 066	880, 362	813, 598	771, 015	391, 730	1. 1	8. 3	5. 5	96. 8
Kansas	1, 151, 293	1, 197, 159	1, 139, 592	1, 155, 907	891, 140	−3. 8	5. 1	−1. 4	29. 7
Delaware	102, 236	105, 237	99, 018	97, 426	97, 619	−2. 9	6. 3	1. 6	−. 2
Maryland	580, 239	637, 154	596, 838	546, 688	559, 100	−8. 9	6. 8	9. 2	−2. 2
Virginia	1, 635, 203	1, 585, 083	1, 514, 117	1, 373, 259	1, 324, 608	3. 2	4. 7	10. 3	3. 7
West Virginia	1, 094, 694	992, 877	833, 335	681, 429	564, 407	10. 3	19. 1	22. 3	20. 7
North Carolina	2, 068, 753	1, 887, 813	1, 707, 020	1, 502, 190	1, 344, 634	9. 6	10. 6	13. 6	11. 7
South Carolina	1, 389, 737	1, 290, 568	1, 169, 060	1, 034, 966	921, 038	7. 7	10. 4	13. 0	12. 4
Georgia	2, 167, 973	2, 070, 471	1, 869, 949	1, 579, 881	1, 397, 090	4. 7	10. 7	18. 4	13. 1
Florida	612, 645	533, 539	421, 511	314, 064	242, 546	14. 8	26. 6	34. 2	29. 5
Kentucky	1, 783, 087	1, 734, 463	1, 679, 506	1, 501, 922	1, 398, 767	2. 8	3. 3	11. 8	7. 4
Tennessee	1, 726, 659	1, 743, 744	1, 693, 977	1, 520, 124	1, 424, 728	−1. 0	2. 9	10. 8	7. 3
Alabama	1, 838, 857	1, 767, 662	1, 611, 983	1, 361, 166	1, 193, 987	4. 0	9. 7	18. 4	14. 0
Mississippi	1, 550, 497	1, 589, 803	1, 431, 235	1, 210, 634	1, 097, 016	−2. 5	11. 1	17. 3	11. 2
Arkansas	1, 461, 707	1, 371, 768	1, 199, 831	1, 055, 052	770, 505	6. 6	14. 3	13. 7	36. 9
Louisiana	1, 170, 346	1, 159, 872	1, 015, 337	834, 743	700, 556	. 9	14. 2	21. 6	19. 2
Oklahoma	1, 488, 803	1, 337, 000	731, 974	249, 173	----------	11. 4	82. 7	193. 8	------
Texas	3, 150, 539	2, 958, 438	2, 527, 951	1, 880, 016	1, 444, 954	6. 5	17. 0	34. 0	30. 5
Montana	370, 878	242, 633	158, 775	104, 137	32, 172	55. 3	52. 8	52. 5	223. 7
Idaho	312, 829	255, 696	151, 769	88, 548	32, 610	22. 3	68. 5	71. 4	171. 5
Wyoming	137, 054	102, 744	65, 874	41, 071	14, 637	33. 4	56. 0	60. 4	180. 6
Colorado	486, 370	394, 184	279, 049	227, 344	110, 676	23. 4	41. 3	22. 7	90. 0
New Mexico	295, 390	280, 730	167, 929	150, 312	112, 930	5. 2	67. 2	11. 7	33. 1
Arizona	216, 635	141, 094	103, 436	79, 941	33, 433	53. 5	36. 4	29. 4	139. 1
Utah	233, 812	200, 417	171, 322	135, 624	110, 208	16. 7	17. 0	26. 3	23. 0
Nevada	62, 153	68, 508	35, 140	31, 331	42, 913	−9. 3	95. 0	12. 2	−27. 0
Washington	607, 886	536, 460	306, 626	230, 054	67, 995	13. 3	75. 0	33. 3	238. 3
Oregon	392, 370	365, 705	280, 356	232, 611	148, 910	7. 3	30. 4	20. 5	56. 2
California	1, 095, 132	907, 810	707, 354	623, 934	494, 083	20. 6	28. 3	13. 4	26. 3
United States	51, 406, 017	49, 806, 146	45, 614, 142	40, 649, 355	35, 797, 616	3. 2	9. 2	12. 2	13. 8

Bureau of the Census.

[1] A minus sign (−) denotes loss.

[2] Less than one-tenth of 1 per cent.

84771°—28——74

TABLE 518.—*Rural and farm population, percentage of total population gainfully employed in agriculture, and percentage of total*

Census year	Percentage of population			Percentage gainfully employed in agriculture
	"Rural" outside of places 8,000 or more	"Rural" outside of places 2,500 or more	On farms	
1820	95.1			83.1
1830	93.3			
1840	91.5			77.5
1850	87.5			
1860	83.9			
1870	79.1			47.5
1880	77.4	70.5		44.3
1890	71.0	63.9		39.2
1900	67.1	60.0		35.7
1910	61.3	54.2	34.7	33.2
1920	56.2	48.6	29.5	26.3

Bureau of Agricultural Economics. Compiled from reports of Bureau of the Census.

TABLE 519.—*Estimated population, January 1 of 1925, 1926, 1927, and 1928*

	1925	1926	1927	1928
United States	114,553,000	116,257,000	117,882,000	119,320,000
Alabama	2,484,000	2,512,000	2,538,000	2,562,000
Arizona	419,000	436,000	452,000	468,000
Arkansas	1,869,000	1,891,000	1,913,000	1,935,000
California	4,112,000	4,248,000	4,375,000	4,501,000
Colorado	1,032,000	1,050,000	1,066,000	1,083,000
Connecticut	1,555,000	1,589,000	1,621,000	1,653,000
Delaware	236,000	239,000	241,000	243,000
District of Columbia	507,000	521,000	534,000	546,000
Florida	1,256,000	1,290,000	1,340,000	1,389,000
Georgia	3,083,000	3,120,000	3,155,000	3,188,000
Idaho	502,000	515,000	528,000	541,000
Illinois	7,037,000	7,148,000	7,250,000	7,351,000
Indiana	3,079,000	3,110,000	3,137,000	3,164,000
Iowa	2,420,000	2,421,000	2,424,000	2,427,000
Kansas	1,812,000	1,817,000	1,824,000	1,832,000
Kentucky	2,499,000	2,516,000	2,531,000	2,546,000
Louisiana	1,891,000	1,909,000	1,926,000	1,943,000
Maine	785,000	788,000	791,000	794,000
Maryland	1,551,000	1,570,000	1,589,000	1,608,000
Massachusetts	4,130,000	4,171,000	4,220,000	4,269,000
Michigan	4,228,000	4,340,000	4,443,000	4,547,000
Minnesota	2,590,000	2,631,000	2,669,000	2,706,000
Mississippi	[1] 1,790,618	[1] 1,790,618	[1] 1,790,618	[1] 1,790,618
Missouri	3,476,000	3,491,000	3,504,000	3,517,000
Montana	662,000	684,000	705,000	[1] 548,889
Nebraska	1,365,000	1,378,000	1,390,000	1,403,000
Nevada	[1] 77,407	[1] 77,407	[1] 77,407	477,407
New Hampshire	451,000	453,000	454,000	455,000
New Jersey	3,560,000	3,640,000	3,715,000	3,789,000
New Mexico	382,000	386,000	390,000	394,000
New York	11,102,000	11,233,000	11,364,000	11,493,000
North Carolina	2,789,000	2,835,000	2,877,000	2,920,000
North Dakota	641,000	[2] 641,192	[2] 641,192	[2] 641,192
Ohio	6,406,000	6,535,000	6,655,000	6,774,000
Oklahoma	2,271,000	2,318,000	2,363,000	2,407,000
Oregon	856,000	870,000	884,000	896,000
Pennsylvania	9,406,000	9,545,000	9,672,000	9,798,000
Rhode Island	675,000	686,000	699,000	711,000
South Carolina	1,794,000	1,815,000	1,835,000	1,855,000
South Dakota	678,000	685,000	693,000	701,000
Tennessee	2,438,000	2,458,000	2,476,000	2,491,000
Texas	5,163,000	5,263,000	5,355,000	5,447,000
Utah	499,000	509,000	518,000	527,000
Vermont	[1] 352,428	[1] 352,428	[1] 352,428	[1] 352,428
Virginia	2,470,000	2,503,000	2,532,000	2,562,000
Washington	1,497,000	1,524,000	1,550,000	1,576,000
West Virginia	1,623,000	1,654,000	1,683,000	1,712,000
Wisconsin	2,826,000	2,865,000	2,901,000	2,937,000
Wyoming	226,000	233,000	238,000	215,000

Bureau of the Census.

[1] Population Jan. 1, 1920; decrease 1910 to 1920; no estimate made

[2] Population State census, 1925. No estimate made.

TABLE 520.—*Farms reporting sales and purchases through cooperative associations, by States, 1919 and 1924*

Geographic division and State	Sales						Purchases						Sales and purchases			
	Number of farms		Per cent of all farms		Per cent of total cooperative business		Number of farms		Per cent of all farms		Per cent of total cooperative business		Number of farms		Per cent of all farms	
	1919	1924	1919	1924	1919	1924	1919	1924	1919	1924	1919	1924	1919	1924	1919	1924
United States	511,383	884,207	7.9	13.9	89.5	91.9	329,449	362,745	5.1	5.7	10.5	8.1	624,527	987,376	9.7	15.5
New England	4,060	10,845	2.6	6.8	66.1	78.4	7,579	10,787	4.8	6.8	33.9	21.6	10,229	18,458	6.5	11.6
Maine	1,264	2,555	2.6	5.1	48.7	85.9	3,407	1,896	7.1	3.8	51.3	14.1	4,062	3,885	8.4	7.8
New Hampshire	122	428	.6	2.0	32.9	29.2	946	1,701	4.6	8.1	67.1	70.8	1,027	1,933	5.0	9.2
Vermont	1,239	2,745	4.3	9.9	74.0	72.3	1,672	3,186	5.8	11.5	26.0	27.7	2,513	4,886	8.6	17.6
Massachusetts	747	2,091	2.3	6.2	76.2	73.9	1,009	2,278	3.2	6.8	23.8	26.1	1,547	3,653	4.8	10.9
Rhode Island	95	235	2.3	6.0	87.9	82.3	86	213	2.1	5.4	12.1	17.7	145	348	3.6	8.9
Connecticut	593	2,791	2.6	12.0	81.9	87.8	459	1,513	2.0	6.5	18.1	12.2	935	3,753	4.1	16.1
Middle Atlantic	33,854	39,295	8.0	9.4	90.8	87.2	17,884	24,716	4.2	5.9	9.2	12.8	45,079	52,710	10.6	12.6
New York	23,494	26,586	12.2	14.1	95.2	90.6	7,106	12,509	3.7	6.6	4.8	9.4	27,283	31,957	14.1	16.9
New Jersey	2,758	1,401	9.3	4.7	75.9	70.7	2,798	1,606	9.4	5.4	24.1	29.3	4,282	2,379	14.4	8.2
Pennsylvania	7,602	11,308	3.8	5.6	84.2	80.1	7,980	10,601	3.9	5.3	15.8	19.9	13,514	18,374	6.7	9.0
East North Central	144,339	205,409	13.3	19.5	90.3	90.2	83,518	103,199	7.7	9.8	9.7	9.8	173,672	236,552	16.0	22.5
Ohio	19,952	39,995	7.8	16.3	85.4	88.6	21,250	24,711	8.3	10.1	14.6	11.4	30,621	48,127	11.9	19.7
Indiana	14,638	28,550	7.1	14.6	87.9	90.7	10,019	14,558	4.9	7.4	12.1	9.3	19,212	33,905	9.4	17.3
Illinois	24,797	52,606	10.5	23.3	93.5	94.7	12,303	17,471	5.2	7.7	6.5	5.3	28,628	56,518	12.1	25.1
Michigan	42,104	38,730	21.4	20.1	90.9	84.4	18,154	25,124	9.2	13.0	9.1	15.6	47,021	47,446	23.9	24.7
Wisconsin	42,848	45,528	22.6	23.6	89.0	88.0	21,792	21,335	11.5	11.0	11.0	12.0	48,190	50,556	25.5	26.2
West North Central	243,288	303,190	22.2	27.3	87.5	91.9	166,084	140,568	15.1	12.6	12.5	8.1	284,123	327,510	25.9	29.9
Minnesota	78,314	79,891	43.9	42.4	92.6	95.0	29,611	26,066	16.6	13.8	7.4	5.0	81,145	82,419	45.5	43.8
Iowa	43,350	72,639	20.3	34.0	89.8	92.5	32,530	34,034	15.2	15.9	10.2	7.5	51,630	79,188	24.2	37.1
Missouri	17,748	60,860	6.7	23.4	82.0	87.7	17,954	33,343	6.8	12.8	18.0	12.3	25,496	66,637	9.7	25.6
North Dakota	17,438	12,913	22.4	17.0	86.4	92.6	12,579	5,527	16.2	7.3	13.6	7.4	19,814	13,479	25.5	17.7
South Dakota	20,241	17,769	27.1	22.3	89.8	92.8	13,754	8,835	18.4	11.1	10.2	7.2	22,517	19,341	30.2	24.3
Nebraska	32,543	28,139	26.2	22.0	82.2	89.8	27,335	15,461	22.0	12.1	17.8	10.2	40,333	31,331	32.4	24.5
Kansas	33,654	30,979	20.4	18.7	82.1	89.8	32,321	17,322	19.6	10.4	17.9	10.2	43,188	35,115	26.1	21.2
South Atlantic	9,517	90,879	.8	8.2	88.8	93.7	12,230	20,830	1.1	1.8	11.2	6.3	18,770	99,899	1.6	9.0

TABLE 520.—*Farms reporting sales and purchases through cooperative associations, by States, 1919 and 1924*—Continued

Geographic division and State	Sales: Number of farms, 1919	Sales: Number of farms, 1924	Sales: Per cent of all farms, 1919	Sales: Per cent of all farms, 1924	Sales: Per cent of total cooperative business, 1919	Sales: Per cent of total cooperative business, 1924	Purchases: Number of farms, 1919	Purchases: Number of farms, 1924	Purchases: Per cent of all farms, 1919	Purchases: Per cent of all farms, 1924	Purchases: Per cent of total cooperative business, 1919	Purchases: Per cent of total cooperative business, 1924	Sales and purchases: Number of farms, 1919	Sales and purchases: Number of farms, 1924	Sales and purchases: Per cent of all farms, 1919	Sales and purchases: Per cent of all farms, 1924
Delaware	548	193	5.4	1.9	88.1	47.3	275	415	2.7	4.0	11.9	52.7	610	507	6.0	4.9
Maryland	1,865	6,121	3.9	12.5	91.9	88.9	637	3,817	1.3	7.8	8.1	11.1	2,177	8,283	4.5	16.9
Virginia	3,849	27,560	2.1	14.2	89.4	94.3	5,161	5,768	2.8	3.0	10.6	5.7	7,537	30,377	4.0	15.7
West Virginia	625	3,106	.7	3.4	56.6	74.2	2,203	2,769	2.5	3.1	43.4	25.8	2,565	5,055	2.9	5.6
North Carolina	850	22,167	.3	7.8	61.2	96.7	2,976	2,791	1.1	9.8	38.8	3.3	3,524	23,308	1.3	8.2
South Carolina	203	10,601	.1	6.1	88.4	96.4	186	819	.1	4.7	11.6	3.6	338	10,675	.2	6.2
Georgia	210	13,376	.1	5.4	93.2	96.8	411	2,388	.1	9.6	6.8	3.2	586	13,705	.2	5.5
Florida	1,367	7,755	2.5	13.1	94.2	91.2	381	2,063	.7	3.5	5.8	8.8	1,433	7,989	2.7	13.5
East South Central	12,705	91,073	1.2	9.0	87.4	94.9	5,285	21,293	.5	2.1	12.6	5.1	15,488	97,547	1.5	9.7
Kentucky	3,498	53,704	1.3	20.8	86.4	98.2	2,344	3,308	.9	1.3	13.6	1.8	4,543	54,506	1.7	21.1
Tennessee	1,255	15,303	.5	6.0	82.0	94.2	1,174	4,490	.5	1.8	18.0	5.8	2,121	16,398	.8	6.5
Alabama	2,678	11,365	1.0	4.8	92.1	87.3	422	7,640	.2	3.2	7.9	12.7	2,825	13,744	1.1	5.8
Mississippi	5,274	10,701	1.9	4.2	88.8	91.8	1,345	5,855	.5	2.3	11.2	8.2	5,999	12,899	2.2	5.0
West South Central	15,635	67,715	1.6	6.6	90.6	96.6	9,332	17,720	.9	1.7	9.4	3.4	18,755	73,259	1.9	7.2
Arkansas	2,885	8,861	1.2	4.0	96.5	93.9	1,072	3,910	.5	1.8	3.5	6.1	3,144	10,389	1.4	4.7
Louisiana	4,284	10,114	3.2	7.6	91.8	91.7	1,591	4,393	1.2	3.3	8.2	8.3	4,329	11,079	3.2	8.4
Oklahoma	5,980	19,049	3.1	9.6	87.9	96.9	4,900	4,878	2.6	2.5	12.1	3.1	7,718	20,753	4.0	10.5
Texas	2,486	29,691	.6	6.4	87.2	98.0	1,769	4,539	.4	1.0	12.8	2.0	3,564	31,038	.8	6.7
Mountain	12,785	24,581	5.2	10.5	82.2	95.3	13,875	8,000	5.7	3.4	17.8	4.7	19,697	26,947	8.1	11.5
Montana	1,948	2,899	3.4	6.2	63.8	95.8	2,926	708	5.1	1.5	36.2	4.2	3,804	3,069	6.6	6.5
Idaho	2,336	3,272	5.5	8.1	83.8	94.9	2,653	1,040	6.3	2.6	16.2	5.1	3,749	3,734	8.9	9.2
Wyoming	370	1,231	2.3	7.9	82.5	81.7	611	512	3.9	3.3	17.5	18.3	737	1,403	4.7	9.0
Colorado	5,847	10,828	9.8	18.7	84.9	96.0	5,613	3,703	9.4	6.4	15.1	4.0	7,789	11,591	13.0	20.0
New Mexico	975	2,014	3.3	6.3	82.6	95.9	574	829	1.9	2.6	17.4	4.1	1,247	2,348	4.2	7.4
Arizona	150	523	1.8	4.8	90.6	95.9	121	222	1.2	2.0	9.4	4.1	224	674	2.2	6.2
Utah	1,127	3,775	4.4	14.5	85.8	95.3	1,377	974	5.4	3.7	14.2	4.7	2,145	4,085	8.4	15.7
Nevada	2	39	.1	1.0	100.0	89.9		12		.3		10.1	2	43	.1	1.1
Pacific	35,200	51,229	15.0	19.3	95.0	92.5	13,662	15.612	5.8	5.9	5.0	7.5	38,714	54.494	16.5	20.5
Washington	5,583	13,205	8.4	18.0	85.0	85.6	5,355	6,500	8.1	8.9	15.0	14.4	7,457	14,526	11.2	19.8
Oregon	3,845	5,590	7.7	10.0	88.7	87.4	2,515	2,858	5.0	5.1	11.3	12.6	4,842	6,503	9.6	11.6
California	25,772	32,425	21.9	23.8	96.7	94.8	5,792	6,254	4.9	4.6	3.3	5.2	26,415	33,465	22.4	24.5

Bureau of Agricultural Economics. Compiled from reports of Bureau of the Census.

TABLE 521.—*Farms selling and purchasing through cooperative associations, tenure distribution, by States, 1924*

Geographic division and State	Selling								Purchasing							
	Farms reporting sales				Amount of sales				Farms reporting purchases				Amount of purchases			
	Owners	Managers	Tenants	All	Owners	Managers	Tenants	All	Owners	Managers	Tenants	All	Owners	Managers	Tenants	All
	Per cent	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
United States	68.1	0.6	31.3	100	67.9	2.6	29.5	100	73.4	0.6	26.0	100	76.7	2.7	20.6	100
New England	91.6	1.5	6.9	100	89.3	2.9	7.8	100	92.6	1.9	5.5	100	89.4	5.8	4.8	100
Maine	97.3	.7	2.0	100	96.8	1.2	2.0	100	97.2	.5	2.3	100	96.8	.9	2.3	100
New Hampshire	94.2	1.4	4.4	100	91.6	4.7	3.7	100	94.4	1.6	4.0	100	91.6	4.8	3.6	100
Vermont	85.2	1.8	13.0	100	78.8	5.3	15.9	100	89.5	1.9	8.6	100	81.6	11.3	7.1	100
Massachusetts	93.3	2.7	4.0	100	91.7	4.3	4.0	100	91.7	3.7	4.6	100	90.5	6.5	3.0	100
Rhode Island	79.1	1.7	19.2	100	73.4	1.7	24.9	100	88.3	2.3	9.4	100	93.5	2.9	3.6	100
Connecticut	92.0	1.2	6.8	100	90.6	1.8	7.6	100	93.2	1.2	5.6	100	92.2	1.3	6.5	100
Middle Atlantic	83.9	.8	15.3	100	82.1	1.9	16.0	100	84.6	1.0	14.4	100	84.0	2.2	13.8	100
New York	83.9	.9	15.2	100	81.8	1.9	16.3	100	86.2	.9	12.9	100	86.5	2.1	11.4	100
New Jersey	76.8	1.5	21.7	100	78.0	3.4	18.6	100	77.3	1.6	21.1	100	77.4	2.6	20.0	100
Pennsylvania	84.8	.7	14.5	100	84.1	1.5	14.4	100	83.8	1.0	15.2	100	82.7	2.3	15.0	100
East North Central	70.5	.5	29.0	100	66.0	1.2	32.8	100	75.2	.5	24.3	100	76.9	1.1	22.0	100
Ohio	68.3	.4	31.3	100	67.5	1.3	31.2	100	71.0	.5	28.5	100	72.9	.9	26.2	100
Indiana	68.9	.4	30.7	100	65.6	.9	33.5	100	70.3	.4	29.3	100	70.3	.9	28.8	100
Illinois	53.5	.6	45.9	100	52.2	1.5	46.3	100	57.4	.5	42.1	100	60.7	1.3	38.0	100
Michigan	82.0	.5	17.5	100	80.4	1.2	18.4	100	85.6	.6	13.8	100	86.8	1.6	11.6	100
Wisconsin	83.4	.4	16.2	100	80.9	.9	18.2	100	85.7	.5	13.8	100	86.9	.9	12.2	100
West North Central	65.0	.3	34.7	100	66.3	.4	33.3	100	68.0	.2	31.8	100	72.1	.5	27.4	100
Minnesota	70.7	.3	29.0	100	70.5	.4	29.1	100	72.9	.2	26.9	100	74.4	.4	25.2	100
Iowa	55.1	.4	44.5	100	58.8	.5	40.7	100	59.2	.3	40.5	100	65.2	.9	33.9	100
Missouri	75.7	.2	24.1	100	77.4	.6	22.0	100	78.3	.2	21.5	100	82.2	.6	17.2	100
North Dakota	70.8	.2	29.0	100	73.6	.2	26.2	100	73.3	.1	26.6	100	75.3	.2	24.5	100
South Dakota	58.8	.1	41.1	100	64.1	.2	35.7	100	62.6	.1	37.3	100	70.0	.1	29.9	100
Nebraska	56.6	.1	43.3	100	62.6	.2	37.2	100	61.6	.1	38.3	100	70.6	.1	29.3	100
Kansas	61.1	.1	38.8	100	65.4	.2	34.4	100	64.8	.2	35.0	100	70.7	.4	28.9	100
South Atlantic	65.7	.6	33.7	100	67.6	3.0	29.4	100	75.8	1.3	22.9	100	78.8	3.7	17.5	100

TABLE 521.—*Farms selling and purchasing through cooperative associations, tenure distribution, by States, 1924*—Continued

Geographic division and State	Selling								Purchasing							
	Farms reporting sales				Amount of sales				Farms reporting purchases				Amount of purchases			
	Owners	Managers	Tenants	All	Owners	Managers	Tenants	All	Owners	Managers	Tenants	All	Owners	Managers	Tenants	All
	Per cent	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*	*Per cent*
Delaware	65.3	1.5	33.2	100	65.3	6.9	27.8	100	61.9	0.7	37.4	100	57.1	2.3	40.6	100
Maryland	68.1	1.4	30.5	100	66.5	3.2	30.3	100	70.3	2.2	27.5	100	74.3	3.0	22.7	100
Virginia	60.8	.3	38.9	100	56.2	.5	43.3	100	83.3	1.3	15.4	100	81.4	2.4	16.2	100
West Virginia	86.6	.7	12.7	100	85.4	4.2	10.4	100	91.1	1.2	7.7	100	87.8	3.7	8.5	100
North Carolina	69.6	.1	30.3	100	70.7	.4	28.9	100	76.8	.2	23.0	100	77.2	.7	22.1	100
South Carolina	56.4	.4	43.2	100	69.6	2.1	28.3	100	56.0	.6	43.4	100	68.9	2.5	28.6	100
Georgia	59.3	.8	39.9	100	65.8	3.6	30.6	100	44.3	.9	54.8	100	60.4	2.9	36.7	100
Florida	85.4	2.6	12.0	100	81.8	9.8	8.4	100	90.2	1.6	8.2	100	87.1	7.2	5.7	100
East South Central	63.9	.1	36.0	100	64.2	.6	35.2	100	68.7	.3	31.0	100	75.2	1.4	23.4	100
Kentucky	64.6	.1	35.3	100	62.8	.3	36.9	100	84.3	.1	15.6	100	80.3	.3	19.4	100
Tennessee	68.9	.1	31.0	100	69.7	.2	30.1	100	69.8	.2	30.0	100	76.0	.5	23.5	100
Alabama	66.6	.3	33.1	100	70.8	.9	28.3	100	65.3	.3	34.4	100	74.6	1.8	23.6	100
Mississippi	50.1	.1	49.8	100	58.4	1.4	40.2	100	63.6	.3	36.1	100	71.9	2.2	25.9	100
West South Central	55.8	.2	44.0	100	55.8	1.3	42.9	100	66.3	.4	33.3	100	67.0	1.2	31.8	100
Arkansas	65.8	.5	33.7	100	60.6	4.4	35.0	100	72.9	.5	26.6	100	72.8	.8	26.4	100
Louisiana	57.9	.4	41.7	100	60.4	5.7	33.9	100	69.1	.9	30.0	100	74.0	2.2	23.8	100
Oklahoma	56.8	.1	43.1	100	60.4	.3	39.3	100	65.2	.1	34.7	100	70.3	.2	29.5	100
Texas	51.4	.1	48.5	100	51.4	.3	48.3	100	59.0	.1	40.9	100	54.0	1.3	44.7	100
Mountain	69.8	.5	29.7	100	58.5	1.6	39.9	100	78.9	.6	20.5	100	77.3	3.4	19.3	100
Montana	79.9	.2	19.9	100	80.9	.5	18.6	100	79.9	.6	19.5	100	77.0	.9	22.1	100
Idaho	75.9	.7	23.4	100	78.2	1.1	20.7	100	86.8	.5	12.7	100	88.8	1.7	9.5	100
Wyoming	78.0	.7	21.3	100	75.1	14.0	10.9	100	84.4	1.7	13.9	100	78.2	11.2	10.6	100
Colorado	55.9	.6	43.5	100	45.7	1.0	53.3	100	72.1	.5	27.4	100	72.9	2.2	24.9	100
New Mexico	75.3	.3	24.4	100	73.0	2.9	24.1	100	77.8	.7	21.5	100	81.5	3.1	15.4	100
Arizona	83.7	2.1	14.2	100	69.2	3.4	27.4	100	77.5	2.2	20.3	100	69.6	7.7	22.7	100
Utah	88.9	.1	11.0	100	87.0	.8	12.2	100	93.7	.1	6.2	100	94.7	.1	5.2	100
Nevada	87.2	----	12.8	100	94.9	----	5.1	100	83.3	----	16.7	100	91.0	----	9.0	100
Pacific	87.3	3.6	9.1	100	76.8	12.0	11.2	100	86.7	3.1	10.2	100	77.4	9.8	12.8	100
Washington	86.6	.9	12.5	100	79.9	5.3	14.8	100	87.0	1.3	11.7	100	86.2	4.5	9.3	100
Oregon	86.4	1.5	12.1	100	82.4	5.9	11.7	100	87.3	2.4	10.3	100	83.6	8.6	7.8	100
California	87.8	5.0	7.2	100	75.6	14.1	10.3	100	86.0	5.3	8.7	100	69.5	14.0	16.5	100

Bureau of Agricultural Economics. Compiled from reports of Bureau of the Census.

TABLE 522.—*Freight tonnage originating on railways in the United States, 1920–1927*

Commodity	Calendar year						
	1921	1922	1923	1924	1925	1926	1927 (preliminary)
FARM PRODUCTS							
Animals and animal products:	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*	*1,000 short tons*
Animals, live—							
Horses and mules	428	491	603	531	544	513	541
Cattle and calves	8, 522	9, 567	9, 400	9, 316	9, 330	9, 241	8, 636
Sheep and goats	1, 175	1, 159	1, 159	1, 215	1, 224	1, 270	1, 296
Hogs	5, 504	5, 795	6, 944	6, 707	5, 502	5, 271	5, 369
Packing-house products—							
Fresh meats	2, 578	2, 614	3, 023	3, 001	2, 904	2, 996	2, 986
Hides and leather	972	1, 081	1, 090	1, 025	1, 026	984	1, 010
Other packing-house products	2, 094	2, 049	2, 397	2, 395	2, 140	2, 023	1, 957
Total packing-house products	5, 644	5, 744	6, 510	6, 421	6, 070	6, 003	5, 953
Eggs	551	565	597	572	591	644	651
Butter and cheese	434	507	571	649	686	725	747
Poultry	276	292	366	376	357	408	407
Wool	400	360	291	294	263	281	356
Other animals and products	1, 329	1, 750	1, 814	1, 668	1, 758	1, 888	2, 054
Total animals and animal products	24, 268	26, 230	28, 255	27, 749	26, 325	26, 244	26, 010
Vegetable products:							
Cotton	3, 191	3, 074	2, 887	3, 261	4, 127	4, 482	4, 182
Fruits and vegetables	9, 255	9, 683	10, 398	10, 868	11, 634	12, 223	12, 029
Potatoes	4, 639	4, 829	4, 698	4, 590	4, 614	4, 339	4, 723
Grain and grain products—							
Grain—							
Wheat	29, 039	24, 805	23, 091	27, 442	21, 548	24, 379	26, 237
Corn	17, 218	19, 275	15, 151	14, 883	12, 680	13, 924	13, 162
Oats	7, 542	7, 646	8, 332	8, 507	8, 450	6, 496	5, 518
Other grain	4, 568	5, 245	4, 739	5, 616	4, 564	4, 014	5, 216
Grain products—							
Flour and meal	10, 553	10, 694	10, 518	10, 330	9, 901	10, 137	10, 027
Other mill products	7, 881	9, 000	10, 002	10, 083	9, 578	9, 768	10, 170
Total grain and grain products	76, 801	76, 665	71, 833	76, 861	66, 721	68, 718	70, 339
Hay, straw, and alfalfa	5, 154	5, 723	5, 965	5, 802	5, 506	5, 028	4, 168
Sugar, sirup glucose, and molasses	4, 767	5, 091	4, 891	5, 356	5, 700	5, 744	5, 584
Tobacco	927	882	1, 099	1, 069	1, 038	1, 010	1, 053
Other vegetable products	15, 186	11, 868	13, 406	15, 277	17, 118	17, 609	18, 499
Total vegetable products	110, 920	117, 815	115, 177	123, 084	116, 458	110, 153	120, 852
Canned goods (food products)	2, 627	3, 106	3, 435	3, 731	4, 144	4, 070	4, 204
Total farm products	146, 810	147, 151	146, 867	154, 564	146, 927	149, 467	151, 066
OTHER FREIGHT							
Products of mines	511, 271	532, 098	713, 735	638, 520	678, 336	758, 064	714, 108
Products of forests	76, 419	89, 059	115, 618	108, 090	107, 391	104, 859	99, 391
Manufactures	163, 691	211, 308	258, 471	246, 432	274, 001	284, 640	279, 405
Merchandise, all l. c. l. freight	41, 992	43, 229	44, 339	40, 551	40, 587	39, 498	38, 432
Total tonnage	940, 183	1, 023, 745	1, 279, 030	1, 188, 157	1, 247, 242	1, 336, 528	1, 282, 402

Bureau of Agricultural Economics. Compiled from reports of the Interstate Commerce Commission. Figures for earlier years appear in previous issues of the Yearbook.

TABLE 523.—*Cotton: Index numbers of freight rates from representative points in producing regions to representative markets, 1913–1927*

Origin and destination	Year beginning July—						
	1913	1914	1915	1916	1917	1918	1919
Fayetteville, N. C., to Greensboro, N. C	100	100	100	100	101	160	160
Tarboro, N. C., to Norfolk, Va.[1]	100	100	100	100	101	175	206
Sumter, S. C., to Greenville, S. C	100	100	100	100	101	144	144
Cordele, Ga., to Savannah, Ga.[1]	100	100	100	100	101	143	149
Griffin, Ga., to Columbus, Ga	100	100	100	100	101	165	165
Griffin, Ga., to Boston, Mass	100	100	100	100	100	123	131
Memphis, Tenn., to Spartanburg, S. C	100	100	100	100	100	126	130
Murfreesboro, Tenn., to New Orleans, La.[1]	100	100	100	100	100	126	146
Huntsville, Ala., to Greenville, S. C	100	100	100	100	101	133	133
Murtlewood, Ala., to Mobile, Ala.[1]	100	100	100	100	101	139	139
Talladega, Ala., to Savannah, Ga.[1]	100	102	106	110	111	142	142
Clarksdale, Miss., to New Orleans, La.[1]	100	100	100	100	101	133	142
Clarksdale, Miss., to Boston, Mass.[2]	100	100	102	102	102	102	131
Meridian, Miss., to New Orleans, La	100	100	100	100	100	126	133
Tunica, Miss., to Spartanburg, S. C	100	100	100	100	100	121	121
Tupelo, Miss, to Greensboro, N. C	100	100	100	100	100	125	125
Caruthersville, Mo., to Boston, Mass	100	100	101	102	102	123	126
Blytheville, Ark., to Boston, Mass	100	100	101	102	102	122	124
Clarendon, Ark., to Charlotte, N. C	100	100	100	100	104	122	122
Helena, Ark., to New Orleans, La.[1]	100	100	100	100	101	145	153
Hope, Ark., to Galveston, Tex.[1]	100	100	100	100	100	125	125
Pine Bluff, Ark., to New Orleans, La.[1]	100	100	100	100	100	129	129
Alexandria, La., to Greenville, S. C	100	100	101	104	105	125	125
Shreveport, La., to New Orleans, La.[1]	100	101	101	101	116	151	148
Shreveport, La., to Galveston, Tex.[1]	100	102	102	102	114	148	145
Ardmore, Okla., to Greenville, S. C	100	100	100	100	100	115	115
Chickasha, Okla., to Galveston, Tex.[1]	100	100	100	100	100	121	121
Duke, Okla., to Galveston, Tex	100	100	100	100	100	120	120
Guthrie, Okla., to Boston via Galveston, Tex	100	100	101	106	118	164	158
Guthrie, Okla., to Boston, Mass	100	101	101	101	102	116	118
Hugo, Okla., to New Orleans, La.[3]	100	100	100	100	101	124	124
Corsicana, Tex., to Galveston, Tex.[1]	100	100	100	100	105	131	134
Denton, Tex., to New York, N. Y.[2]	100	101	101	105	118	137	137
Georgetown, Tex., to Fall River, Mass.[2]	100	101	101	104	114	145	138
Marlin, Tex., to San Francisco, Calif.[1]	100	100	100	100	105	132	132
Marlin, Tex., to Galveston, Tex.[1]	100	100	100	100	105	135	135
Memphis, Tex., to Galveston, Tex.[1]	100	100	100	100	105	134	134
Mineola, Tex., to New Orleans, La.[3]	100	100	100	100	104	130	130
Palestine, Tex., to New Orleans, La.[1]	100	100	100	100	104	130	130
Spurr, Tex., to Houston, Tex.[1]	100	72	72	73	76	101	101
Average	100	100	100	100	103	133	136

Origin and destination	Year beginning July—							
	1920	1921	1922	1923	1924	1925	1926	1927
Fayetteville, N. C., to Greensboro, N. C	192	188	190	193	196	196	196	198
Tarboro, N. C., to Norfolk, Va.[1]	264	262	250	250	250	250	210	240
Sumter, S. C., to Greenville, S. C	175	181	181	181	181	176	171	171
Cordele, Ga., to Savannah, Ga.[1]	186	184	176	176	179	180	180	180
Griffin, Ga., to Columbus, Ga	176	209	187	176	170	170	170	170
Griffin, Ga., to Boston, Mass	172	170	161	161	161	161	161	161
Memphis, Tenn., to Spartanburg, S. C	160	157	149	149	178	190	190	190
Murfreesboro, Tenn., to New Orleans, La.[1]	186	183	174	174	167	164	161	164
Huntsville, Ala., to Greenville, S. C	161	158	150	150	156	159	159	159
Murtlewood, Ala., to Mobile, Ala.[1]	171	170	162	162	176	182	182	182
Talladega, Ala., to Savannah, Ga.[1]	174	172	164	164	163	162	162	162
Clarksdale, Miss., to New Orleans, La.[1]	177	175	178	181	181	180	180	180
Clarksdale, Miss., to Boston, Mass.[2]	179	177	172	173	173	173	173	173
Meridian, Miss., to New Orleans, La	164	160	152	152	152	152	152	152
Tunica, Miss., to Spartanburg, S. C	148	145	137	137	140	141	141	141
Tupelo, Miss., to Greensboro, N. C	151	148	140	140	149	154	154	154
Caruthersville, Mo., to Boston, Mass	165	182	163	165	165	165	165	165
Blytheville, Ark., to Boston, Mass	164	171	159	161	161	161	161	161
Clarendon, Ark., to Charlotte, N. C	155	157	141	141	146	149	149	149
Helena, Ark., to New Orleans, La.[1]	197	250	247	247	247	247	247	247
Hope, Ark., to Galveston, Tex.[1]	163	162	152	152	153	153	153	153
Pine Bluff, Ark., to New Orleans, La.[1]	167	167	166	167	175	177	177	177
Alexandria, La., to Greenville, S. C	161	160	150	150	157	161	161	161
Shreveport, La., to New Orleans, La.[1]	188	195	175	172	168	168	168	185

[1] Export. [2] Rail and water. [3] Domestic.

TABLE 523.—*Cotton Index number of freight rates from representative points in producing regions to representative markets, 1913–1927*—Continued

Origin and destination	Year beginning July—							
	1920	1921	1922	1923	1924	1925	1926	1927
Shreveport, La., to Galveston, Tex.[1]	186	194	175	188	188	188	188	183
Ardmore, Okla., to Greenville, S. C.	148	151	135	135	135	135	135	135
Chickasha, Okla., to Galveston, Tex.[1]	158	164	148	148	148	148	148	148
Duke, Okla., to Galveston, Tex.	156	162	146	146	146	146	146	146
Guthrie, Okla., to Boston via Galveston, Tex.	198	205	164	164	164	149	149	149
Guthrie, Okla., to Boston, Mass.	155	161	145	146	147	147	147	147
Hugo, Okla., to New Orleans, La.[3]	161	161	151	151	151	151	151	151
Corsicana, Tex., to Galveston, Tex.[1]	174	181	163	163	163	163	163	163
Denton, Tex., to New York, N. Y.[2]	176	183	165	163	162	162	162	162
Georgetown, Tex., to Fall River, Mass.[2]	177	190	168	165	165	166	166	166
Marlin, Tex., to San Francisco, Calif.[1]	158	150	142	142	142	142	142	142
Marlin, Tex., to Galveston, Tex.[1]	175	183	164	164	164	164	164	164
Memphis, Tex., to Galveston, Tex.[1]	174	181	163	163	163	163	163	163
Mineola, Tex., to New Orleans, La.[3]	168	168	157	157	157	157	157	157
Palestine, Tex., to New Orleans, La.[1]	168	175	157	157	157	157	157	157
Spurr, Tex., to Houston, Tex.[1]	134	151	142	142	143	143	143	143
Average	172	176	164	164	166	166	166	166

Bureau of Agricultural Economics. Based on rates secured from records of the Interstate Commerce Commission. These relatives are based on the average of the monthly rates in effect during the crop year. Rates in effect in 1913 equal 100. Index numbers for 1927 represent six months only; rates in effect to Dec. 31, 1927.

[1] Export. [2] Rail and water. [3] Domestic.

TABLE 524.—*Index numbers of freight rates on livestock, wheat, and cotton, 1913–1927*

Year beginning July 1	Livestock						
	Cattle				Hogs		
	Western district	Eastern district	Southern district	United States	Western district	Eastern district	United States
1913	100	100	100	100	100	100	100
1914	100	101	100	100	99	102	100
1915	100	108	99	101	99	107	101
1916	100	113	98	102	99	116	102
1917	101	116	98	103	100	122	104
1918	126	158	120	129	124	169	132
1919	128	157	120	131	124	169	132
1920	166	207	148	170	161	222	172
1921	165	211	147	170	160	230	173
1922	156	197	137	160	153	218	164
1923	155	201	136	160	153	217	164
1924	153	199	136	159	151	214	163
1925	153	199	136	158	149	214	161
1926	153	199	136	158	150	214	161
1927[1]	153	199	136	158	150	214	161

[1] Based on rates in effect to Dec. 31, 1927.

TABLE 524.—*Index numbers of freight rates on livestock, wheat, and cotton, 1913–1927*—Continued

Year beginning July 1	Livestock—Continued				Wheat				Cotton
	Sheep			Total	Spring	Western	Winter	All wheat[2]	
	Western district	Eastern district	United States						
1913	100	100	100	100	100	100	100	100	100
1914	99	102	99	100	100	100	101	101	100
1915	98	105	99	101	101	100	100	100	100
1916	98	112	100	102	101	100	101	101	100
1917	99	129	103	103	101	100	101	101	103
1918	118	167	126	130	127	126	129	128	133
1919	119	167	127	131	127	126	128	128	136
1920	152	225	164	170	164	154	166	164	172
1921	148	226	160	170	160	148	162	160	176
1922	137	199	147	160	149	140	152	150	164
1923	137	200	147	160	149	140	152	150	164
1924	137	200	146	158	149	140	152	150	166
1925	136	200	146	157	148	140	152	150	166
1926	136	200	145	157	148	140	152	150	166
1927[1]	136	200	145	157	148	140	152	150	166

Bureau of Agricultural Economics. These relatives are based on the average of the monthly rates in effect during the crop year. Rates in effect in 1913=100. For points of origin and destination, see Yearbook, 1926, pp. 1248–1249.

[1] Based on rates in effect to Dec. 31, 1927.
[2] Index for spring, western, and winter wheat weighted respectively 2, 1, and 5. Weight based on average production, 1923–1927.

TABLE 525.—*Freight rates, ocean: Wheat, per bushel to the United Kingdom from the United States, Canada, Argentina, India, and Australia, 1913, 1926, and 1927*

Month	United States										Canada[5]		Argentina			India			Australia		
	North Atlantic ports[1]			New York[2]			New Orleans[3]		North Pacific ports[4]												
	1913	1926	1927	1913	1926	1927	1926	1927	1926	1927	1926	1927	1913	1926	1927	1913	1926	1927	1913	1926	1927
	Cts.	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
Jan.	10	9	11	9	9	9	11	14	22	25	9	9	14	10	21	12	14	18	24	20	31
Feb.	10	6	9	6	6	8	11	11	19	24	7	9	16	8	20	12	13	18	22	20	31
Mar.	9	6	7	6	5	6	11	12	17	24	7	8	14	9	18	12	12	18	22	17	31
Apr.	8	6	8	6	5	6	10	12	17	24	7	9	12	11	18	11	10	16	20	16	26
May	8	7	9	7	7	6	10	11	19	21	9	8	11	11	19	11	9	14	20	18	25
June	7	8	(6)	5	6	6	12	15	19	22	9	6	8	12	16	11	12	14	20	16	26
July	8	10	(6)	5	6	5	15	10	20	21	9	6	9	17	13	12	13	12	20	26	23
Aug.	9	11	(6)	5	7	5	12	9	20	21	9	8	10	17	15	12	12	13	19	20	22
Sept.	8	12	10	4	10	7	12	9	22	22	12	9	8	18	14	11	13	14	19	26	25
Oct.	7	19	9	5	17	7	20	9	27	21	18	10	6	26	13	10	16	13	21	29	25
Nov.	7	21	8	5	22	7	26	10	30	21	24	10	6	31	15	11	21	14	21	31	25
Dec.	6	13	7	4	13	6	15	10	28	20	14	6	6	25	16	10	19	14	20	34	21
Average	8	11	9	6	9	6	14	11	22	22	11	8	10	16	16	11	14	15	21	24	26

Bureau of Agriculture Economics. Compiled from reports of the International Institute of Agriculture except as otherwise indicated. The above rates were originally quoted in shillings; conversions made at par.

[1] Average of North Atlantic ports, including New York.
[2] New York to Liverpool.
[3] From U. S. Shipping Board.
[4] Average of North Pacific ports.
[5] Rates from April to November are from port of Montreal to Liverpool; rates for other months from Atlantic ports of Canada to United Kingdom.
[6] No published rates available.

TABLE 526.—*Fertilizer and fertilizer materials: Production and value, in the United States, 1924–1926*

Item	Quantity			Value		
	1924	1925	1926	1924	1925	1926
	Short tons	*Short tons*	*Short tons*	*Dollars*	*Dollars*	*Dollars*
Fish scrap, dried and acidulated	45, 951		46, 992			
Lime sold for agricultural purposes [1]	248, 336	298, 976	297, 010	1, 864, 514	2, 129, 169	2, 153, 233
Lime, calcareous marl and peat for fertilizer:						
Calcareous marl, sold	72, 710	68, 670	55, 060	225, 383	187, 839	146, 094
Hydrated lime, sold	128, 410	166, 965	184, 293	1, 160, 822	1, 384, 651	1, 465, 572
Limestone, pulverized, sold	1, 352, 600	1, 954, 480	1, 850, 620	2, 046, 860	2, 880, 589	3, 064, 235
Peat, produced	55, 196	[2] 72, 436	[2] 61, 936	387, 319	[2] 452, 898	[2] 364, 413
Total	1, 608, 916	2, 262, 551	2, 151, 909	3, 820, 384	4, 905, 977	5, 040, 314
Phosphate rock, sold or used:						
Florida—	*Long tons*	*Long tons*	*Long tons*	*Dollars*	*Dollars*	*Dollars*
Hard rock	143, 115	171, 649	116, 264	629, 579	707, 933	465, 308
Soft rock						
Land pebble	2, 289, 466	2, 758, 315	2, 591, 943	7, 387, 897	8, 081, 137	8, 218, 200
Total	2, 432, 581	2, 929, 964	2, 708, 207	8, 017, 476	8, 789, 070	8, 683, 508
South Carolina—						
Land rock		2, 147			8, 051	
Tennessee—						
Brown rock	[3] 375, 260	[4] 477, 077	[4] 464, 192	[3] 1,958,272	[4] 2,429,059	[4] 2, 048, 272
Blue rock	21, 378			81, 766		
Total	[3] 396, 638	[4] 477, 077	[4] 464, 192	[3] 2,040,038	[4] 2,429, 059	[4] 2, 048, 272
Other States	38, 570	72, 631	37, 577	194, 569	319, 498	162, 020
Total phosphate rock	2, 867, 789	3, 481, 819	3, 209, 976	10, 252, 083	11, 545, 078	10, 893, 800
Pyrites produced	160, 096	170, 081	166, 550	645, 262	650, 448	616, 668

Bureau of Agricultural Economics. Compiled from annual reports of the American Fertilizer Handbook, Bureau of Mines, and the Geological Survey. Figures for earlier years appear in previous issues of the Yearbook.

[1] Porto Rico and Hawaii included.
[2] Production for all purposes. Peat produced for agricultural purposes represented 99.6 per cent of total production in 1924.
[3] Includes brown rock from Kentucky.
[4] Blue and brown rock from Tennessee and Kentucky.

TABLE 527.—*Fertilizers: Farm expenditures, by States, census years, 1879–1924*

State	1879	1889	1899	1909	1919	1924 [1]
	1,000 dollars	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*
Maine	212	456	820	4, 069	7, 759	7, 096
New Hampshire	165	246	368	513	526	441
Vermont	128	217	447	571	857	794
Massachusetts	653	897	1, 321	1, 966	3, 907	3, 336
Rhode Island	140	173	264	335	380	301
Connecticut	497	610	1, 078	1, 954	4, 894	4, 309
New York	2, 716	3, 628	4, 493	7, 142	15, 067	11, 807
New Jersey	1, 602	1, 838	2, 165	4, 278	10, 743	8, 697
Pennsylvania	3, 525	3, 384	4, 086	6, 802	15, 628	11, 189
Ohio	550	1, 603	2, 696	4, 180	13, 206	9, 082
Indiana	341	778	1, 554	2, 190	8, 735	5, 712
Illinois	174	125	831	616	2, 996	2, 238
Michigan	301	173	492	945	4, 873	3, 071
Wisconsin	179	105	294	128	780	1, 137
Minnesota	93	62	251	75	433	454
Iowa	99	87	337	110	507	538
Missouri	110	66	371	671	3, 041	1, 498
North Dakota		9	14	10	120	76
South Dakota		16	13	11	34	52
Nebraska	21	19	153	31	85	133
Kansas	62	20	268	76	979	342

[1] Including lime.

TABLE 527.—*Fertilizers: Farm expenditures, by States, census years, 1879–1924*—Continued

State	1879	1889	1899	1909	1919	1924
	1,000 dollars	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*
Delaware	467	460	539	865	1,222	1,142
Maryland	2,838	2,420	2,619	3,388	7,610	5,126
District of Columbia	22	17	23	17	23	39
Virginia	2,137	2,320	3,682	6,932	17,278	13,083
West Virginia	176	211	405	529	1,710	1,049
North Carolina	2,112	2,882	4,479	12,262	48,797	32,002
South Carolina	2,660	3,867	4,494	15,162	52,547	24,306
Georgia	4,347	5,724	5,739	16,860	46,196	21,100
Florida	73	857	753	3,610	10,317	12,624
Kentucky	146	317	908	1,351	3,597	2,279
Tennessee	157	361	898	1,216	3,525	2,786
Alabama	1,201	2,422	2,599	7,631	14,066	14,564
Mississippi	123	789	932	2,703	4,288	6,262
Arkansas	56	94	173	597	2,573	2,995
Louisiana	278	906	1,077	2,005	3,840	4,140
Oklahoma		4		29	453	203
Texas	75	59	125	595	1,831	4,124
Montana		5	4	12	126	6
Idaho		2	17	21	106	59
Wyoming		2	13	5	9	7
Colorado	5	25	23	61	294	127
New Mexico	11	9	3	25	113	88
Arizona		(2)	3	6	41	46
Utah	11	23	14	20	109	42
Nevada	3	2		8	10	2
Washington		12	29	87	526	535
Oregon	11	13	27	69	490	458
California	109	149	937	2,144	8,183	8,371
United States	28,586	38,470	53,431	114,883	326,400	230,528

Bureau of Agriculture Economics. Compiled from reports of the Bureau of the Census.

[2] Less than $500.

TABLE 528.—*Fertilizers and fertilizer materials: Production, consumption, imports and exports, United States, 1922–1926*

Item	1922	1923	1924	1925	1926
Sulphate of ammonia:	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*
Production	476,761	603,363	569,622	664,019	[1] 690,976
Consumption [2]	317,274	435,209	443,771	552,714	[1] 497,508
Nitrate of soda, imports for consumption	607,560	998,680	1,105,035	1,245,693	1,024,009
Sulphuric acid:					
Production (50° Baumé) [3]	1,423,917	1,631,216	1,576,544	1,079,292	1,745,759
Imports for consumption [4]	1,447	11,754	7,734	18,191	27,969
Exports	6,235	4,122	5,636	3,769	4,612
Made and consumed [3]	1,589,809	1,365,883	1,782,816	1,316,316	2,058,683
Acid phosphate:					
Production [3]	2,788,207	3,367,220	3,250,498	3,846,401	3,799,054
Sales [3 5]	3,062,633	3,037,393	3,381,202	3,550,762	3,536,552
Potash:					
Production, domestic	25,176	39,029	43,719	51,565	46,324
Sales, domestic	22,028	35,164	37,492	52,823	51,369
Imports for consumption—					
Kainit	169,287	187,833	175,513	204,767	203,702
Manure salts	218,406	301,721	258,998	430,340	354,413
Muriate of potash	179,484	151,757	144,623	180,351	223,049
Sulphate of potash	64,534	71,390	84,780	77,226	78,258
Other potash-bearing substances [6]	5,682	32,228	46,946	29,002	52,357
Total imports for consumption	637,393	744,929	710,860	921,686	911,779

Bureau of Agricultural Economics. Compiled from annual reports of the Bureau of the Census, Bureau of Mines, Bureau of Foreign and Domestic Commerce, Geological Survey, and the American Fertilizer Handbook. Figures for earlier years appear in previous issues of the Yearbook.

[1] Subject to revision.
[2] Production plus imports for consumption minus domestic exports.
[3] Fertilizer establishments only.
[4] Imports for all purposes.
[5] Quantity sold as acid phosphate or used in the manufacture of other fertilizers.
[6] Includes ashes (wood), beet root, other potash-bearing substances (alunite, leucite, etc.) used for fertilizer.

TABLE 529.—*Guano: Imports into the United States, 1909–1927*

Year ended June 30—	Quantity	Value	Year ended June 30—	Quantity	Value
	Tons	*Dollars*		*Tons*	*Dollars*
1909	36, 999	580, 334	1919	8, 218	293, 425
1910	52, 330	845, 765	1920	18, 796	1, 550, 098
1911	29, 516	593, 306	1921	37, 570	3, 158, 064
1912	34, 706	684, 658	1922	1, 305	48, 875
1913	19, 075	340, 915	1923	(1)	(1)
1914	21, 887	755, 833	1924	[2] 4, 982	[2] 191, 659
1915	20, 945	534, 391	1925	24, 556	737, 896
1916	15, 837	425, 377	1926	17, 855	692, 124
1917	3, 563	73, 398	1927 (preliminary)	20, 579	834, 447
1918	10, 096	287, 440			

Bureau of Agricultural Economics. Compiled from Foreign Commerce and Navigation of the United States, 1913–1918 and Monthly Summary of Foreign Commerce of the United States, June issues, 1921–1927.

[1] Included in "All other fertilizers." [2] Beginning Jan. 1, 1924.

TABLE 530.—*Fertilizer materials: Imports into the United States, 1912–1927*

Year ended June 30—	Bone dust and bone ash [1]		Kainit		Manure salts [2]	
	Quantity	Value	Quantity	Value	Quantity	Value
	Tons	*Dollars*	*Tons*	*Dollars*	*Tons*	*Dollars*
1912	33, 864	830, 616	485, 132	2, 390, 761	192, 738	1, 814, 071
1913	33, 337	801, 713	466, 705	2, 154, 977	171, 802	1, 794, 058
1914	41, 450	1, 034, 636	541, 846	2, 579, 619	261, 342	2, 767, 241
1915	23, 428	584, 748	79, 004	444, 760	66, 062	760, 699
1916	20, 466	521, 153	64	1, 795	2, 271	41, 825
1917	14, 305	385, 541	----------	----------	324	7, 794
1918	8, 511	286, 704	----------	----------	190	8, 872
1919	4, 138	117, 690	----------	----------	----------	----------
1920	7, 340	306, 301	274, 761	5, 655, 660	249, 348	8, 819, 620
1921	27, 413	1, 317, 876	204, 834	4, 882, 974	123, 273	4, 164, 817
1922	18, 234	495, 445	83, 571	585, 338	81, 442	957, 443
1923	52, 933	1, 380, 413	168, 514	1, 018, 054	[3] 244, 760	2, 398, 098
1924	66, 820	1, 783, 534	181, 288	1, 080, 132	268, 203	2, 988, 634
1925	35, 908	730, 880	142, 888	855, 277	344, 260	3, 293, 254
1926	55, 152	1, 377, 389	190, 955	1, 252, 942	417, 986	4, 238, 520
1927 (preliminary)	82, 187	1, 902, 439	147, 203	1, 048, 858	264, 227	2, 939, 600

Year ended June 30—	Ammonia sulphate		Potash			
			Muriate		Sulphate	
	Quantity	Value	Quantity	Value	Quantity	Value
	Tons	*Dollars*	*Tons*	*Dollars*	*Tons*	*Dollars*
1912	65, 906	4, 143, 417	215, 957	7, 235, 718	44, 476	1, 826, 836
1913	54, 089	3, 655, 413	201, 220	6, 782, 056	42, 745	1, 753, 485
1914	74, 444	4, 888, 563	237, 886	7, 915, 523	45, 139	1, 897, 740
1915	57, 048	3, 208, 152	102, 732	3, 666, 118	21, 852	1, 071, 761
1916	19, 610	1, 371, 007	2, 130	461, 431	2, 423	197, 808
1917	8, 176	647, 271	606	174, 806	661	20, 538
1918	3, 983	407, 999	723	195, 154	135	19, 837
1919	1, 964	278, 409	1, 677	201, 307	137	23, 304
1920	2, 587	343, 107	110, 324	11, 038, 173	6, 350	1, 073, 322
1921	2, 537	226, 300	49, 911	5, 290, 196	12, 081	1, 659, 998
1922	6, 356	314, 286	131, 423	5, 549, 580	45, 280	2, 085, 348
1923	1, 785	116, 686	150, 461	4, 759, 134	51, 776	2, 109, 966
1924	5, 848	337, 032	119, 605	3, 828, 891	68, 399	2, 685, 129
1925	21, 188	1, 198, 428	154, 447	4, 737, 224	67, 202	2, 553, 248
1926	13, 340	724, 067	181, 015	5, 801, 061	61, 465	2, 409, 474
1927 (preliminary)	3, 470	205, 568	162, 871	5, 252, 086	71, 534	2, 871, 408

Bureau of Agricultural Economics. Compiled from Foreign Commerce and Navigation of the United States, 1913–1918 and Monthly Summary of Foreign Commerce of the United States, June issues, 1921–1927.

[1] Classified in 1924–1927 as "Bone phosphate and other phosphate material."
[2] Classified as "Manure salts and other potash-bearing substances."
[3] Includes "Other potash-bearing substances" amounting to 20,734 tons and valued at $238,651.

TABLE 531.—*Fertilizer, commercial: Sold in cotton States, 1921–1927*

COMMERCIAL FERTILIZER

State	Year ending—	1921	1922	1923	1924	1925	1926 [1]	1927 [1]
		Short tons	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*	*Short tons*
Virginia	Dec. 31	369, 490	449, 942	422, 350	441, 895	451, 656	323, 130	295, 955
North Carolina	June 30	695, 543	936, 275	1, 081, 811	1, 189, 315	1, 217, 467	1, 213, 178	1, 144, 019
South Carolina	June 24	669, 484	505, 768	678, 795	879, 093	866, 377	840, 955	720, 000
Georgia	June 28	556, 573	535, 084	677, 040	690, 075	789, 822	763, 520	687, 286
Florida	May 31	289, 857	329, 668	379, 000	386, 521	361, 849	352, 458	405, 992
Alabama	Sept. 30	179, 547	298, 147	434, 374	472, 412	579, 127	592, 000	461, 000
Mississippi	do	50, 869	130, 648	215, 854	213, 516	257, 113	219, 393	129, 527
Louisiana	Aug. 31	38, 760	66, 470	107, 368	129, 288	103, 989	116, 049	90, 090
Texas	May 31	19, 204	33, 420	75, 599	120, 000	102, 653	135, 000	66, 733
Arkansas	Sept. 30	14, 550	40, 325	74, 599	84, 995	122, 742	103, 722	55, 816
Tennessee	May 31	84, 044	96, 992	112, 656	117, 137	135, 270	135, 257	115, 973
Total		2, 967, 921	3, 422, 739	4, 259, 446	4, 724, 247	4, 988, 065	4, 794, 662	4, 172, 391

COTTONSEED MEAL USED AS FERTILIZER [2]

North Carolina	June 30	136, 141	99, 155	108, 772	117, 626	109, 029	150, 377	176, 4[illegible]
Mississippi	Sept. 30	43, 703	39, 290	41, 867	45, 123	50, 905	61, 497	81, [illegible]

Bureau of Agricultural Economics. Based on sales of fertilizer tags.
Figures for earlier years appear in previous issues of the Yearbook.

[1] For 1926 and 1927 sales are reported to the following dates: June 30, for North Carolina, South Carolina, Georgia, Texas, and Arkansas; all other States for May 31. Sales after these dates do not usually exceed more than 1 or 2 per cent of the United States total for the year.

[2] Not separately reported except for North Carolina and Mississippi.

TABLE 532.—*Fertilizer used on cotton, 1925–1927*

State	Acreage in cotton					
	June 25			Fertilized		
	1925	1926	1927	1925	1926	1927
	1,000 acres	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*	*1,000 acres*
Virginia	101	95	73	97	89	69
North Carolina	2, 037	2, 015	1, 814	1, 996	1, 955	1, 741
South Carolina	2, 708	2, 716	2, 580	2, 540	2, 553	2, 374
Georgia	3, 662	4, 025	3, 622	3, 479	3, 804	3, 405
Florida	103	108	70	93	98	59
Alabama	3, 539	3, 699	3, 329	3, 185	3, 366	2, 930
Mississippi	3, 501	3, 809	3, 390	1, 750	1, 828	1, 322
Louisiana	1, 903	2, 019	1, 656	799	848	662
Texas	19, 139	19, 140	17, 035	957	766	426
Arkansas	3, 814	3, 867	3, 287	1, 335	1, 469	986
Tennessee	1, 191	1, 178	954	596	580	458
Missouri	542	472	307	27	24	15
Oklahoma	5, 320	5, 083	4, 168	27	36	21
California	171	167	128			
Arizona	162	168	140			
New Mexico	138	125	106	1	1	1
All other	59	44	24			
Total or average	48, 090	48, 730	42, 683	16, 888	17, 486	14, 460

TABLE 532.—*Fertilizer used on cotton, 1925-1927*—Continued

State	Fertilizer used					
	Average per acre			Total		
	1925	1926	1927	1925	1926	1927
	Pounds	*Pounds*	*Pounds*	*Short tons*	*Short tons*	*Short tons*
Virginia	390	390	375	18,915	17,355	12,938
North Carolina	450	440	420	449,100	430,100	365,610
South Carolina	350	325	315	445,550	414,862	373,905
Georgia	265	257	247	460,968	496,524	420,518
Florida	232	245	215	10,788	12,005	6,342
Alabama	245	255	243	390,162	429,165	355,995
Mississippi	213	222	216	186,375	202,908	142,776
Louisiana	171	190	175	68,314	80,560	57,925
Texas	175	185	185	83,738	70,855	39,405
Arkansas	185	185	173	123,488	135,882	85,289
Tennessee	219	220	206	65,262	64,790	47,174
Missouri	120	125	125	1,620	1,500	938
Oklahoma	160	175	145	2,160	3,150	1,522
California						
Arizona						
New Mexico	180	190	165	90	95	82
All other						
Total or average	273	270	264	2,306,530	2,359,751	1,910,419

State	Value								
	Average price per ton			Total			Average per acre		
	1925	1926	1927	1925	1926	1927	1925	1926	1927
	Dollars	*Dollars*	*Dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*Dollars*	*Dollars*	*Dollars*
Virginia	31.50	30.50	24.00	596	529	311	6.14	5.94	4.51
North Carolina	30.50	30.10	24.00	13,698	12,946	8,775	6.86	6.62	5.04
South Carolina	29.50	29.20	22.00	13,144	12,114	8,226	5.16	4.75	3.47
Georgia	31.60	31.10	23.00	14,567	15,442	9,672	4.19	4.00	2.84
Florida	31.00	30.50	27.50	334	366	174	3.59	3.73	2.95
Alabama	32.70	33.20	26.00	12,758	14,248	9,256	4.01	4.23	3.16
Mississippi	37.00	37.50	32.30	6,896	7,609	4,612	3.94	4.16	3.49
Louisiana	41.00	38.60	31.00	2,801	3,110	1,969	3.51	3.67	2.97
Texas	37.00	37.20	33.20	3,098	2,636	1,308	3.24	3.44	3.07
Arkansas	37.00	38.40	31.50	4,569	5,218	2,687	3.42	3.55	2.73
Tennessee	32.50	36.20	28.30	2,121	2,345	1,335	3.56	3.98	2.91
Missouri	35.00	35.00	35.50	57	52	33	2.11	2.17	2.20
Oklahoma	30.00	31.00	32.00	65	98	49	2.41	2.72	2.33
California									
Arizona									
New Mexico	30.00	35.00	32.50	3	3	3	3.00	3.00	3.00
All other									
Total or average	32.39	32.51	25.34	74,707	76,716	48,410	4.42	4.59	3.35

Bureau of Agricultural Economics. Based on returns from crop correspondents. Figures for earlier years appear in previous issues of the Yearbook.

TABLE 533.—*Coffee: International trade, average 1909–1913, annual 1923–1926*

Country	Average, 1909–1913		1923		1924		1925		1926, preliminary	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
PRINCIPAL EXPORTING COUNTRIES										
Brazil		1,672,282		1,913,512		1,881,888		1,783,339		1,818,927
British India	[1] 605	27,780	5,486	22,424	3,126	23,435	2,540	29,003	4,746	12,247
Colombia		104,398	(2)	272,576	1	293,109		257,722		[3] 324,639
Costa Rica		27,515		24,455		40,147		33,847		[3] 40,232
Dutch East Indies	4,227	54,149	663	85,116	3,455	160,899	3,474	153,725		[3] 163,018
Guatemala		85,951		96,748		89,855		97,987		[4] 93,255
Haiti		61,943		79,031		64,719		72,495		73,666
Jamaica		8,263		8,633		[3] 5,815		[3] 11,650		[3] 7,439
Mexico	[1] 167	48,991	2,630	38,733	4,463	31,744	[3] 721	[3] 53,150	[3] 112	[3] 37,637
Nicaragua	[5] 138	19,033	[3] 90	30,231	[3] 63	39,677	[3] 67	23,859		[3] 37,117
Salvador	[6] 1,593	62,830	(2)	92,580	(2)	107,604		70,689		[3] 111,611
Venezuela		111,326		102,366		120,271		118,254		133,946
PRINCIPAL IMPORTING COUNTRIES										
Argentina	28,125		45,140		55,788		44,286		[3] 51,309	
Austria	[7] 128,304	[7] 8	11,880	13	15,828	[3] 26	14,891	[3] 9	[3] 18,873	[3] 4
Belgium	111,738	33,627	91,015	1,203	89,282	1,188	85,181	533	88,000	413
British Malaya	[3] 7,524	[3] 7,137	21,133	14,508	16,494	10,893	18,905	11,885	18,581	10,154
Canada	13,378	55	20,818	27	22,810	42	21,185	55	24,747	41,029
Cuba	24,906	4	36,744	1	35,920	1	28,202	1	15,671	2
Czechoslovakia			31,082	13	32,371	[3] 1	28,136	[3] 3	29,167	
Denmark	33,102	152	48,825	120	51,108	103	45,243	183	55,984	535
Egypt	15,654		22,461	26	24,257	138	17,179	24	20,815	10
Finland	28,624		31,448		37,039		41,712		29,162	
France	245,752	41	379,396	822	376,791	779	370,673	369	339,298	293
Germany	399,965	1,757	85,414	109	122,221	139	200,329	359	232,364	267
Hungary			2,632	144	4,379	60	5,895	(2)	6,934	
Italy	58,278	459	105,963	10	103,574	22	93,070	10	96,417	3
Netherlands	253,633	189,288	115,563	46,951	141,899	58,199	133,793	45,933	114,436	45,133
Norway	29,309		38,205		35,552		31,999		37,085	
Poland			12,470	(2)	13,397	1	15,644	1	13,990	1
Russia	25,073		[8] 469		[8] 2,459		[8] [3] 2,459		[5] [8] 1,246	
Spain	29,317	9	53,772	7	49,536	11	42,846	1	44,680	3
Sweden	74,486	24	92,812	102	97,543	41	80,592	3	92,519	31
Switzerland	27,029	62	28,272	60	32,455	72	24,054	91	29,144	150
Union of South Africa	26,458	36	32,934	12	30,724	16	29,001	8	27,833	12

United Kingdom	28,581	241	[9] 32,697	156	22,221	212	49,559	216	25,189	------
United States	997,899	1,144,251	1,406,755	22,367	1,420,870	28,731	1,253,695	23,207	1,493,316	29,433
Yugoslavia [3]	------	------	20,235	46	18,382	5	22,054	19	20,506	2
Total 37 countries	2,332,865	2,581,611	2,714,611	2,857,102	2,572,036	2,959,843	2,737,884	2,790,630	2,932,124	2,981,209

Bureau of Agricultural Economics. Compiled from official sources except where otherwise noted.
The item coffee comprises unhulled and hulled, ground or otherwise prepared, but imitation or "surrogate" coffee and chicory are excluded.

[1] Four-year average.
[2] Less than 500 pounds.
[3] International Yearbook of Agriculture Statistics.
[4] Consular report 240,656 FF 41,676.
[5] Three-year average.
[6] One year only.
[7] Average for Austria-Hungary.
[8] Year ended Sept. 30.
[9] Reexports in excess of imports.
[10] Chiefly from Porto Rico.

TABLE 534.—*Coffee, Rio. No. 7: Average wholesale price per pound, New York, 1920–1927*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average [1]
	Cents	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*	*Cents*
Av. 1921–1925	12.5	13.1	13.2	12.8	12.4	13.1	12.8	13.0	13.5	13.9	14.3	14.2	13.2
1920	16.3	14.8	15.0	15.1	15.6	15.0	13.1	9.4	8.2	7.6	7.5	6.6	12.0
1921	6.7	6.7	6.4	6.0	6.2	6.7	6.5	7.0	7.9	8.1	8.8	9.3	7.2
1922	9.6	9.0	9.6	10.8	11.0	11.0	10.4	10.0	10.2	10.2	10.8	11.1	10.3
1923	11.9	13.0	13.0	11.5	11.6	11.7	10.9	10.7	10.7	11.1	11.0	10.9	11.5
1924	10.9	14.2	15.6	15.3	14.8	14.6	16.5	16.6	17.7	20.7	22.6	22.6	16.8
1925	23.4	22.4	21.2	20.2	18.6	21.6	19.7	20.7	21.2	19.5	18.5	17.1	20.3
1926	18.5	19.1	18.2	18.3	19.8	20.1	19.8	19.2	17.7	16.1	16.3	15.3	18.2
1927	15.3	14.9	15.8	16.2	15.4	14.8	14.2	13.9	13.5	14.7	14.5	14.2	14.8

Bureau of Agricultural Economics. Compiled from Bureau of Labor Statistics reports. Data for 1890–1919 are available in 1924 Yearbook, p. 832, Table 426.

[1] Derived from the figures upon which the monthly averages are based.

TABLE 535.—*Tea: International trade, average 1909–1913, annual 1923–1926*

Country	Year ended Dec. 31									
	Average, 1909–1913		1923		1924		1925		1926, preliminary	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
PRINCIPAL EXPORTING COUNTRIES	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
British India	8,002	267,887	17,713	331,611	19,930	353,557	[1] 7,536	[2] 344,142	[1] 7,297	350,909
Ceylon	[3] 1	189,016	1	181,940	(4)	204,930	1	209,791	(4)	217,184
China	18,890	197,997	129	99,492	5,072	94,211	3,211	108,875	11,011	109,129
Dutch East Indies	6,742	46,675	6,602	104,871	7,090	121,586	7,933	102,281	[5 6] 7,053	[6] 120,184
Formosa	68	23,640	82	21,205	58	20,745	29	21,028	[6] 59	[6] 22,926
Japan	590	35,823	1,684	27,359	1,267	24,036	777	28,041	1,115	23,965
PRINCIPAL IMPORTING COUNTRIES										
Argentina	3,890	—	3,772	—	4,379	—	4,071	—	[6] 2,739	—
Australia	35,442	(4)	[7] 48,502	—	[7] 49,256	—	[6] 49,935	—	[6] 46,949	—
Austria	[8] 3,424	[8] 3	955	2	1,463	[6] 2	875	(4 6)	1,231	—
British Malaya	[6] 11,983	[6] 5,318	8,227	1,394	8,424	1,248	9,127	1,301	11,198	1,533
Canada	37,927	—	41,289	—	35,861	—	37,392	—	37,630	—
Chile	3,505	—	5,228	—	4,740	—	5,233	—	5,168	—
Czechoslovakia	—	—	1,165	2	1,423	(4)	1,351	(4)	1,448	9
Egypt	1,950	—	6,602	239	8,156	274	9,644	221	8,408	300
France	2,806	61	2,985	237	3,662	171	3,841	125	3,571	108
French Indo-China	3,295	1,145	[6] 3,836	[6] 1,933	[6] 4,036	[6] 1,668	4,060	2,281	5,592	2,530
Germany	8,964	23	5,463	10	8,951	6	9,153	1	10,116	(4)
Hungary	—	—	416	16	538	4	49	1	41	22
Irish Free State	—	—	—	—	24,360	—	22,611	—	23,596	—
Morocco	6,696	—	8,224	1	10,566	—	12,020	—	11,181	—
Netherlands	11,383	45	35,468	15	23,933	29	10,949	26	26,177	25
New Zealand	7,542	—	9,968	—	10,787	—	10,835	—	10,928	—
Persia	9,446	125	12,967	2,422	14,502	2,596	14,449	2,135	—	—
Poland	—	—	5,313	127	3,201	43	3,717	3	3,938	1
Russia	157,704	866	[6] 5,142	[6] 105	[6] 17,558	[6] 650	[6] 37,138	[6] 1,769	[6 9] 48,627	[6 9] 1,263
Union of South Africa	5,192	61	8,963	133	9,407	10	9,815	8	10,303	127
United Kingdom	293,045	—	392,531	—	434,621	—	402,156	—	410,986	—
United States	98,897	—	105,138	—	92,773	—	100,962	—	95,930	—
Total, 28 countries	737,384	768,685	738,365	773,114	806,007	825,766	787,870	822,029	802,295	850,215

Bureau of Agricultural Economics. Official sources except where otherwise noted. "Tea" includes tea leaves only and excludes dust, sweepings, and yerba mate.

[1] Sea trade only.
[2] Includes 9 months (April–December) land trade.
[3] Two-year average.
[4] Less than 500 pounds.
[5] Java and Madura only.
[6] International Yearbook of Agricultural Statistics.
[7] Year beginning July 1.
[8] Average for Austria-Hungary.
[9] Oct. 1–Sept. 30.

Table 536.—*Tea, Formosa, fine: Average wholesale price per pound, New York, 1920–1927*

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Average[1]
	Cts.	*Cts.*	*Cts.*	*Cts.*	*Cs.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
Av. 1921–1925	30.3	30.3	30.3	30.2	29.9	29.8	29.8	29.8	30.0	30.4	31.6	32.3	30.4
1920	36.5	36.5	36.5	36.5	36.5	36.5	36.5	31.3	31.0	31.0	28.6	23.8	33.7
1921	24.5	24.5	24.5	24.1	22.4	22.0	22.0	22.0	22.3	23.0	28.0	20.0	24.0
1922	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.5	30.5	31.0	31.0	30.2
1923	31.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0
1924	31.0	31.0	31.0	31.0	31.0	31.0	31.0	31.0	31.3	32.5	32.9	35.0	31.7
1925	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.0	35.3	35.0
1926	35.5	35.5	35.5	35.5	35.5	35.5	35.5	35.5	35.5	35.5	35.5	35.0	35.5
1927	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5	32.9	32.5	34.2

Bureau of Agricultural Economics. Compiled from Bureau of Labor Statistics reports. Data for 1890–1919 are available in 1924 Yearbook, p. 834, Table 427.

[1] Derived from the figures upon which the monthly averages are based.

TABLE 537.—*Oil cake and oil-cake meal: International trade, average 1909–1913, annual 1923–1926*

Country	Year ended Dec. 31									
	Average, 1909–1913		1923		1924		1925		1926, preliminary	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
PRINCIPAL EXPORTING COUNTRIES	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Argentina		42,587		78,876		102,113		98,270		
Australia	148	1,347	[1] 518	[1] 5,860	[1] 33	[1] 16,857				
Brazil		[2] 6,574		24,196		31,960		70,586		
British India	1,262	268,648	2,226	359,679	1,844	446,866	[3] 157	[3] 437,179	[3] 305	499,052
Canada	7,752	51,370	3,548	40,114	6,124	34,303	8,774	46,397	19,192	39,323
China	[4] 174	147,468		196,655		188,903		259,092		284,486
Czechoslovakia			26,522	35,065	48,611	41,098	46,706	48,800	57,249	61,045
Dutch East Indies	2,509	13,242		42,361		53,190		76,303		
Egypt		161,624		267,508		260,478	3	287,693		355,684
France	288,968	476,863	128,237	323,003	113,479	298,448	52,701	252,003	55,129	305,090
Germany	1,686,416	525,108	90,202	521,098	285,465	457,647	749,836	718,287	971,767	835,906
Hungary			327	8,731			636	9,853	8,591	14,233
Italy	10,550	55,115	752	147,911	290	282,805	1,085	180,815	631	140,812
Peru		10,930		35,695		48,684		51,657		66,656
Russia		1,453,413		498,357		707,811		808,927		[5] 882,060
Spain		2,164	147	15,157	708	18,814	3,504	29,904	1,403	44,445
United States		1,704,124	124,124	917,394	154,572	1,289,948	88,535	1,487,756	120,555	1,449,758
PRINCIPAL IMPORTING COUNTRIES										
Austria	[6] 53,673	[6] 124,873	7,016	2,420	12,532	921	18,988	2,002	20,293	1,812
Belgium	543,648	155,373	215,640	73,509	261,845	63,004	323,070	54,803	278,905	69,855
Ceylon	[7] 40,494	[7] 28,509	41,830	13,056	43,072	17,533	44,720	18,918	42,851	17,953
Denmark	1,002,329	15,777	1,241,054	5,799	1,547,660	18,833	1,627,436	16,238	1,532,525	33,434
Finland	25,333	2,125	107,415	144	89,420		147,192		216,906	
Irish Free State					118,041		126,521		104,666	
Japan	189,838		332,319	10,619	322,873	21,720	356,821	20,083	392,675	29,894
Netherlands	707,116	219,819	493,590	95,195	574,900	79,046	572,491	98,920	731,235	117,686
Norway	55,112	2,889	84,798	169	86,299	668	69,822	141	71,902	
Sweden	346,755	1,535	246,640	4,748	276,096	5,546	207,877	12,203	372,952	6,262
Switzerland	69,352	1,413	85,908	1,243	87,457	6,651	91,071	7,117	83,944	13,653
United Kingdom	790,535	161,793	697,894	111,964	802,285	201,620	1,013,179	131,006	1,105,848	193,265
Total 29 countries	5,822,324	5,634,638	3,930,707	3,841,556	4,833,642	4,695,467	5,551,125	5,224,959	6,189,614	5,462,364

Bureau of Agricultural Economics. Official sources.

The class called here "oil cake and oil-cake meal" includes the edible cake and meal remaining after making oil from such products as cottonseed, flaxseed, peanuts, corn, etc. Soy-bean cake is not included in this table.

[1] Year beginning July 1.
[2] 4-year average.
[3] Sea trade only.
[4] 3-year average.
[5] Economic Review of the Soviet Union, Jan. 1, 1928.
[6] Average for Austria-Hungary.
[7] 1 year only.

TABLE 538.—*Raw silk: Production in specified countries, average 1909–1913, 1921–1925, annual 1919–1926*

Country	Average, 1909–1913	1919	1920	1921	1922	1923	1924	1925	1926
WESTERN EUROPE	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Italy	8,524	4,079	7,330	7,154	8,234	10,803	11,585	9,656	8,499
France	902	408	551	430	437	562	739	573	529
Spain	182	154	176	132	170	154	209	221	187
Total	9,698	4,641	8,057	7,716	8,841	11,519	12,533	10,450	9,215
Eastern Europe, Levant, and Central Asia [1]	6,611	2,039	1,653	1,213	1,543	1,675	2,414	2,524	2,359
FAR EAST									
China:									
Exports from Shanghai	12,576	8,598	7,859	8,840	10,648	9,689	10,505	12,599	12,225
Exports from Canton	5,146	5,071	4,167	5,688	7,000	5,974	6,504	6,923	7,055
Japan:									
Exports from Yokohama and Kobe [2]	21,898	32,188	24,008	40,984	41,546	38,107	54,068	56,978	66,193
British India:									
Exports from Bengal and Cashmere	428	220	170	187	165	110	77	66	121
Indo-China:									
Exports from Saigon, Haipong, etc.	[3] 32	11	33	44	55	88	99	132	143
Total	40,080	46,088	36,243	55,743	59,414	53,968	71,253	76,698	85,737
Grand total	56,389	52,768	45,953	64,672	69,798	67,162	86,200	89,672	97,311

Bureau of Agricultural Economics. Compiled from Statistique de la Production de la Soie, Silk Merchants Union, Lyon, France.

[1] Includes Hungary, Czechoslovakia, Yugoslavia, Rumania, Bulgaria, Greece, Salonika, Adrianople, Crete, the Caucasus, Turkestan, Central Asia, and Persia.
[2] Previous to 1923 only exports from Yokohama are included.
[3] For years 1911–1913.

TABLE 539.—*Federal-aid highway system: Mileage, Federal-aid apportionment for fiscal year 1929, and total apportionment for years 1917 to 1929, inclusive*

State	Mileage in approved system Dec. 31, 1927	Apportionment for fiscal year 1929	Aggregate of apportionment for fiscal years 1917 to 1929, inclusive	State	Mileage in approved system Dec. 31, 1927	Apportionment for fiscal year 1929	Aggregate of apportionment for fiscal years 1917 to 1929, inclusive
Alabama	3,881.00	$1,547,483	$17,414,158	New Hampshire	980.91	365,625	3,900,742
Arizona	1,498.00	1,059,081	11,733,324	New Jersey	1,179.80	935,122	10,337,153
Arkansas	5,021.13	1,281,785	14,165,485	New Mexico	3,298.00	1,189,361	13,348,510
California	4,771.50	2,486,415	27,012,667	New York	5,451.00	3,629,879	41,310,291
Colorado	3,392.00	1,383,401	15,085,733	North Carolina	3,860.80	1,715,910	19,146,472
Connecticut	835.43	474,213	5,280,579	North Dakota	7,191.00	1,193,440	13,137,050
Delaware	[1] 415.81	365,625	3,205,308	Ohio	5,899.30	2,757,964	31,251,909
Florida	1,926.00	901,311	9,885,716	Oklahoma	5,628.00	1,749,066	19,560,744
Georgia	5,560.40	1,980,015	22,391,177	Oregon	2,810.50	1,189,707	13,251,250
Idaho	2,770.00	932,962	10,127,782	Pennsylvania	4,871.22	3,333,786	38,008,302
Illinois	6,616.78	3,135,225	36,121,852	Rhode Island	[1] 356.86	365,625	3,308,819
Indiana	4,701.50	1,921,463	22,052,590	South Carolina	3,230.00	1,059,533	11,916,045
Iowa	7,212.00	2,035,291	23,565,853	South Dakota	5,767.00	1,223,981	13,610,835
Kansas	7,922.00	2,062,196	23,596,139	Tennessee	3,252.80	1,612,012	18,507,369
Kentucky	3,702.45	1,421,029	16,051,785	Texas	11,685.00	4,502,576	49,606,279
Louisiana	2,712.90	1,019,282	11,304,998	Utah	1,677.33	848,093	9,513,778
Maine	1,393.46	681,431	7,827,013	Vermont	1,043.00	365,625	3,999,757
Maryland	[1] 1,503.72	634,906	7,195,082	Virginia	3,233.00	1,437,548	16,381,776
Massachusetts	1,308.00	1,088,808	12,286,634	Washington	2,927.50	1,143,226	12,420,534
Michigan	5,235.00	2,209,596	24,766,652	West Virginia	2,018.31	793,796	8,939,943
Minnesota	6,849.00	2,112,595	23,825,116	Wisconsin	5,493.36	1,864,212	21,173,482
Mississippi	3,604.00	1,309,720	14,745,620	Wyoming	3,097.00	939,547	10,440,100
Missouri	7,530.00	2,404,347	27,595,958	Hawaii	174.60	365,625	1,831,403
Montana	4,665.00	1,552,576	16,528,000				
Nebraska	5,576.55	1,584,981	17,805,364	Total	[1] 187,034.52	73,125,000	817,625,000
Nevada	1,398.00	957,995	10,701,720				

Bureau of Public Roads.

[1] Includes extension of original system which was limited to 7 per cent of total rural-road mileage.

TABLE 540.—*Federal-aid highways completed and under construction*

State	Projects completed and final payment made, year ended June 30, 1927			Projects under construction June 30, 1927		
	Mileage	Total cost	Federal aid	Mileage	Estimated cost	Federal aid allotted
	Miles	*Dollars*	*Dollars*	*Miles*	*Dollars*	*Dollars*
Alabama	101.9	1,834,960.34	889,114.85	398.7	6,750,331.59	3,219,304.80
Arizona	71.0	860,072.45	583,396.92	62.7	1,398,735.50	961,236.28
Arkansas	237.6	3,972,470.13	1,858,494.40	211.5	2,854,174.10	1,386,642.91
California	248.3	7,985,672.14	3,963,434.52	151.4	7,420,526.19	3,420,728.79
Colorado	84.0	1,591,217.27	807,010.73	276.1	6,291,181.71	3,074,539.39
Connecticut	20.2	982,825.10	343,414.74	63.9	5,314,155.45	1,478,079.23
Delaware	35.2	1,318,974.26	563,906.82	32.9	796,771.28	312,891.57
Florida	112.2	3,644,176.05	1,803,550.28	196.3	8,856,112.63	3,897,634.31
Georgia	379.6	7,160,229.53	3,436,994.54	333.7	8,069,503.82	3,985,165.58
Idaho	110.8	2,164,317.31	1,193,414.46	199.1	2,648,283.40	1,650,659.48
Illinois	153.1	4,422,370.30	2,161,520.86	355.8	10,166,322.21	4,867,016.84
Indiana	198.2	6,423,291.87	3,066,443.01	476.9	16,073,034.11	7,567,438.31
Iowa	369.6	5,243,763.46	2,469,301.65	564.6	14,294,224.35	6,290,951.47
Kansas	334.6	4,615,459.97	2,140,340.23	684.6	14,589,667.80	5,739,789.74
Kentucky	116.6	2,478,894.43	1,018,612.50	416.5	9,527,523.23	4,494,951.93
Louisiana	122.8	2,046,959.52	949,152.22	140.9	4,118,538.00	1,935,266.43
Maine	54.0	1,817,247.30	665,945.28	74.8	2,887,249.06	992,794.43
Maryland	54.5	865,260.83	411,947.05	33.9	814,475.47	373,185.64
Massachusetts	35.9	2,316,488.31	768,667.53	92.9	5,990,010.14	1,540,245.69
Michigan	121.2	5,980,007.59	2,501,432.69	365.3	11,900,759.33	5,428,748.35
Minnesota	461.6	7,928,662.52	3,460,029.11	370.0	7,150,669.77	2,112,898.90
Mississippi	185.1	3,185,142.23	1,589,760.52	363.7	6,756,572.72	3,268,960.98
Missouri	401.6	13,400,123.49	5,945,011.63	266.8	9,250,411.52	3,833,292.27
Montana	96.7	1,454,011.91	953,822.80	129.8	1,715,050.00	1,426,969.48
Nebraska	478.3	4,623,638.63	2,265,183.87	1,305.1	12,604,690.58	6,216,951.27
Nevada	514.8	2,863,153.80	2,458,234.09	182.7	1,520,113.16	1,314,359.67
New Hampshire	27.2	876,339.16	401,477.98	30.8	1,024,537.73	460,853.90
New Jersey	26.0	5,881,939.07	2,397,022.27	111.3	7,416,614.44	1,700,308.56
New Mexico	78.2	931,913.17	597,940.68	233.6	3,338,904.18	2,586,415.22
New York	242.3	10,958,805.65	3,781,998.46	579.8	37,212,953.00	9,416,593.95
North Carolina	202.2	8,286,429.74	3,341,565.22	87.6	2,696,070.16	1,296,705.92
North Dakota	522.5	3,508,247.15	1,714,433.90	738.9	5,184,096.96	2,825,402.95
Ohio	150.9	4,921,858.59	1,959,589.73	334.3	11,536,410.43	4,484,341.32
Oklahoma	89.2	2,134,006.75	957,590.06	251.2	4,029,281.98	1,714,249.20
Oregon	115.8	2,555,706.34	1,448,238.15	62.4	2,447,526.13	1,276,070.18
Pennsylvania	345.5	16,360,023.42	4,756,888.28	328.1	15,832,234.37	4,800,636.70
Rhode Island	29.3	1,244,797.29	439,650.00	22.6	1,291,835.67	338,055.00
South Carolina	86.5	1,981,400.03	760,665.87	235.8	6,561,820.95	2,799,135.49
South Dakota	321.7	1,793,690.05	903,698.57	623.6	3,563,268.21	1,913,591.91
Tennessee	88.7	2,658,403.46	1,274,873.53	225.7	8,792,828.20	3,614,687.07
Texas	546.2	9,006,572.89	4,126,705.73	535.1	15,244,074.93	6,770,640.89
Utah	82.5	901,199.30	668,639.27	173.5	2,300,008.82	1,748,014.39
Vermont	18.2	795,075.59	331,156.50	41.7	2,136,881.86	819,113.52
Virginia	163.4	4,853,775.80	2,151,415.14	109.4	4,884,311.35	1,975,028.87
Washington	42.5	1,105,994.34	463,642.49	68.2	3,690,460.86	1,750,600.00
West Virginia	26.5	951,130.88	432,685.38	238.2	7,132,862.00	2,934,191.86
Wisconsin	137.4	3,034,995.97	1,455,153.17	375.5	9,835,564.55	4,592,758.80
Wyoming	182.4	1,722,409.59	1,098,380.00	177.5	2,404,653.81	1,557,096.95
Hawaii	6.5	343,604.15	97,440.00	20.7	1,780,323.80	562,362.64
Total	8,431.0	188,047,767.12	83,828,987.66	13,355.1	340,102,631.60	142,817,679.01

SUMMARY

Year ended June 30—	Completed and final payment made			Projects under construction		
1917				14.7	379,037.94	171,678.87
1918	12.5	257,731.37	112,256.98	976.8	8,749,501.84	3,088,538.71
1919	176.8	2,124,873.48	768,472.17	5,059.7	43,143,567.21	18,010,730.32
1920	716.1	7,405,000.53	3,159,790.53	14,940.0	241,977,217.00	108,925,091.00
1921	2,898.5	42,149,181.36	18,462,089.99	17,978.0	321,560,092.58	135,309,515.82
1922	9,519.3	188,505,291.91	79,654,072.85	18,875.0	322,833,904.00	139,750,165.00
1923	9,973.9	167,262,562.49	71,843,485.42	18,011.1	323,904,579.34	145,517,158.20
1924	9,155.7	141,950,750.13	63,807,102.80	18,053.5	380,649,591.14	172,613,311.94
1925	9,445.5	190,485,399.55	87,802,181.05	17,123.0	389,606,481.37	171,555,021.84
1926	10,628.3	226,552,043.54	100,524,357.58	14,355.1	347,113,666.05	148,527,471.03
1927	8,431.0	188,047,767.12	83,828,987.66	13,355.1	340,102,631.60	142,817,679.01
Total	60,957.6	1,154,740,601.48	[1] 510,007,691.24			

Bureau of Public Roads.

[1] Includes $44,894.21 not shown above, paid soldiers for labor.

TABLE 541.—*Mileage of roads in State highway systems at end of 1926,[1] as reported by State highway departments*

States	Grand total mileage	Earth non-surfaced: Unimproved	Earth non-surfaced: Improved to grade	Surfaced roads, by types: Total surfaced miles	Sand-clay, top-soil	Gravel, chert, etc.	Waterbound macadam (Treated and untreated)	Bituminous macadam	Sheet asphalt	Bituminous concrete	Portland-cement concrete	Brick and block
Alabama	3,936	1,733	31	2,173	608	1,286	41	44	6	91	94	-----
Arizona	2,031	332	278	1,421	-----	1,221	-----	9	15	40	136	-----
Arkansas	8,346	3,037	1,156	4,153	-----	3,312	144	156	32	271	208	-----
California	6,582	2,512	532	3,538	-----	1,015	61	331	-----	415	1,716	-----
Colorado	8,966	4,748	719	3,499	7	3,240	-----	-----	-----	6	246	-----
Connecticut	1,952	-----	133	1,819	-----	387	754	229	-----	141	306	2
Delaware	590	-----	-----	590	-----	23	1	18	6	3	533	6
Florida	5,654	2,879	50	2,725	850	8	927	179	199	34	148	380
Georgia	6,259	3,440	154	2,665	1,598	568	44	146	47	9	252	1
Idaho	4,668	1,845	385	2,438	80	1,797	404	-----	5	105	47	-----
Illinois [2]	9,460	4,686	278	4,496	-----	-----	-----	6	5	9	4,400	76
Indiana	4,262	-----	107	4,155	-----	1,601	1,164	201	-----	25	1,094	70
Iowa	6,654	1,452	1,732	3,470	-----	2,820	-----	-----	-----	-----	617	33
Kansas	7,887	4,985	1,564	1,338	336	239	-----	105	-----	3	507	148
Kentucky [3]	9,647	4,872	583	4,192	-----	1,508	2,230	241	-----	14	173	26
Louisiana [4]	8,000	3,293	-----	4,707	-----	4,630	-----	20	1	25	16	15
Maine	1,575	269	-----	1,306	4	1,002	7	220	-----	-----	73	-----
Maryland	2,420	-----	-----	2,420	-----	359	1,088	-----	38	37	897	1
Massachusetts	1,564	-----	13	1,551	-----	112	316	687	-----	203	230	3
Michigan	6,757	528	-----	6,229	-----	3,633	639	77	-----	203	1,671	6
Minnesota	6,931	67	511	6,353	107	5,390	15	8	-----	73	735	25
Mississippi [5]	6,721	2,490	392	3,839	5	3,575	11	6	7	14	203	19
Missouri	7,640	2,239	2,025	3,376	-----	1,824	-----	95	-----	-----	1,440	17
Montana	7,957	6,755	275	927	-----	885	1	5	-----	4	32	-----
Nebraska	6,256	2,812	680	2,764	444	2,217	-----	-----	3	10	71	19
Nevada	2,996	1,768	205	1,023	10	943	-----	21	-----	2	47	-----
New Hampshire	2,257	195	98	1,963	-----	1,625	111	142	-----	70	15	-----
New Jersey	1,458	26	135	1,297	-----	267	102	38	58	234	550	48
New Mexico	9,214	6,951	578	1,685	-----	1,611	-----	-----	-----	1	73	-----
New York	14,068	4,194	20	9,854	-----	128	2,191	3,986	-----	255	3,009	282
North Carolina	6,218	-----	754	5,461	1,726	891	146	367	66	757	1,455	56
North Dakota	6,838	4,085	1,418	1,335	-----	1,326	-----	-----	1	-----	8	-----
Ohio	11,000	1,008	401	9,591	-----	3,178	1,659	1,508	43	167	1,518	1,488
Oklahoma	5,589	3,778	226	1,585	-----	918	-----	-----	-----	73	557	37
Oregon	4,438	917	301	3,220	-----	2,323	-----	-----	-----	688	209	-----
Pennsylvania	12,034	-----	3,594	8,440	-----	512	3,021	396	200	291	3,636	381
Rhode Island	822	370	-----	452	-----	23	117	116	7	128	61	-----
South Carolina [6]	5,143	1,199	74	3,870	3,070	430	28	11	75	87	169	-----
South Dakota	5,923	1,253	2,202	2,468	21	2,444	-----	-----	-----	-----	3	-----
Tennessee	5,051	1,211	284	3,556	-----	1,565	1,051	548	35	75	282	-----
Texas	18,728	8,093	1,379	9,256	424	5,540	745	1,788	17	47	613	82
Utah	3,249	726	1,333	1,190	-----	934	-----	-----	11	43	202	-----
Vermont	4,462	400	923	3,139	1,000	1,990	50	49	-----	-----	50	-----
Virginia	5,211	1,042	280	3,889	1,014	732	1,062	519	9	3	500	-----
Washington	3,284	565	112	2,607	-----	1,970	-----	31	3	39	560	14
West Virginia	3,786	1,202	851	1,732	-----	332	101	592	1	87	473	146
Wisconsin	10,279	768	1,091	8,420	92	6,046	179	33	-----	-----	2,070	-----
Wyoming	3,136	1,608	599	929	-----	876	15	-----	-----	27	11	-----
Total, 1926	287,928	96,413	28,456	163,059	11,390	79,286	18,428	12,927	800	4,815	31,930	3,381
Total, 1925	274,911	103,271	26,786	144,854	11,025	68,771	16,709	12,105	853	4,561	27,615	3,185
Total, 1924	261,216	94,651	34,456	132,109	10,416	63,158	17,033	10,316	784	4,427	22,825	3,090
Total, 1923	251,611	103,843	36,368	111,400	8,875	52,917	15,432	8,847	651	3,907	17,916	2,865
Total, 1921	209,242	102,963	21,421	[7] 81,858	8,622	36,458	16,073	6,749	396	2,441	10,114	2,089

Bureau of Public Roads.

[1] Data shown for Alabama and Maryland are for year ended Sept. 30; for Connecticut and Kentucky, June 30; and for Massachusetts, Nov. 30.
[2] Legislature added 4,660 miles of unimproved roads to system.
[3] Legislature added 1,647 miles of gravel and macadam roads to system.
[4] Legislature added 4,000 miles of unimproved roads to system.
[5] Legislature added 1,227 miles of county roads to system; includes 509 unimproved, 18 improved earth, and 701 miles of gravel roads.
[6] Legislature added 187 miles of sand-clay roads to system.
[7] Includes, 1,008 miles of miscellaneous surfacing not allocated to types.

Table 542.—*Total State highway income and funds available, 1926, as reported by State authorities*

States	Total funds available	Balance at first of year	Income during year					
			State highway bonds sold	State taxes and appropriations	Motor vehicle fees	Gasoline tax	From counties and miscellaneous	Federal-aid road funds used
	1,000 dollars	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*
Alabama	12, 187	2, 520	5, 628	----------	2, 247	----------	172	1, 620
Arizona	2, 399	245	----------	633	453	450	60	558
Arkansas	10, 406	847	----------	----------	3, 527	4, 017	307	1, 708
California	25, 325	5, 235	----------	4, 890	3, 594	8, 028	302	3, 276
Colorado	7, 599	1, 452	2, 102	1, 017	692	1, 043	157	1, 136
Connecticut	18, 789	5, 661	----------	3, 166	6, 111	2, 405	1, 267	179
Delaware	4, 076	431	1, 108	----------	776	397	1, 123	241
Florida	18, 334	2, 427	----------	521	4, 914	8, 636	825	1, 008
Georgia	10, 592	1, 229	----------	----------	3, 280	2, 329	1, 182	2, 572
Idaho	4, 232	220	----------	321	142	1, 183	966	1, 400
Illinois	25, 978	4, 836	4, 953	----------	13, 938	----------	214	2, 037
Indiana	15, 350	1, 362	----------	----------	5, 301	5, 753	431	2, 500
Iowa	21, 293	3, 791	4, 129	----------	9, 349	1, 575	328	2, 121
Kansas	14, 698	3, 721	----------	135	3, 317	4, 276	1, 500	1, 749
Kentucky	7, 498	4, 804	----------	874	3, 910	3, 476	2, 413	1, 629
Louisiana	10, 715	1, 350	----------	----------	3, 845	2, 657	1, 987	876
Maine	11, 812	1, 379	2, 676	1, 001	2, 468	1, 800	1, 756	762
Maryland	12, 524	1, 723	1, 864	2, 922	2, 206	1, 687	1, 402	720
Massachusetts	17, 512	1, 749	----------	----------	11, 261	----------	3, 690	812
Michigan	29, 773	2, 526	30	----------	11, 236	9, 314	3, 867	2, 800
Minnesota	24, 808	4, 530	----------	1, 953	9, 872	4, 957	654	2, 842
Mississippi	6, 459	1, 085	----------	----------	157	1, 823	1, 981	1, 413
Missouri	37, 903	4, 273	15, 127	----------	7, 869	6, 007	703	3, 924
Montana	1, 261	139	----------	----------	----------	110	352	660
Nebraska	10, 040	3, 401	----------	100	1, 034	3, 016	134	2, 355
Nevada	2, 070	67	----------	173	71	230	598	931
New Hampshire	4, 147	1, 366	----------	----------	1, 517	760	198	306
New Jersey	32, 355	8, 432	5, 086	6, 066	10, 776	----------	744	1, 251
New Mexico	3, 255	530	90	579	275	590	171	1, 020
New York	91, 742	26, 868	22, 200	15, 172	16, 500	----------	7, 390	3, 612
North Carolina	50, 168	2, 481	15, 175	3	7, 424	6, 923	15, 063	3, 099
North Dakota	2, 777	168	----------	350	800	445	85	929
Ohio	30, 483	5, 268	----------	2, 024	5, 399	5, 651	9, 691	2, 450
Oklahoma	12, 938	2, 196	----------	----------	2, 073	4, 138	2, 611	1, 920
Oregon	10, 889	1, 453	----------	----------	4, 260	3, 013	898	1, 265
Pennsylvania	75, 894	18, 718	14, 179	----------	24, 761	8, 473	7, 436	2, 327
Rhode Island	4, 523	1, 002	----------	370	1, 858	700	72	521
South Carolina	9, 893	160	----------	----------	1, 907	2, 682	3, 585	1, 559
South Dakota	6, 580	1, 008	----------	765	1, 268	1, 925	150	1, 464
Tennessee	14, 970	1, 774	500	24	3, 363	3, 915	3, 016	2, 378
Texas	20, 013	91	----------	----------	10, 487	3, 920	714	4, 801
Utah	2, 672	86	----------	----------	46	1, 143	489	908
Vermont	4, 053	542	----------	2, 244	----------	191	370	706
Virginia	13, 234	513	----------	1, 831	4, 242	2, 865	1, 269	2, 514
Washington	8, 826	----------	----------	----------	4, 012	3, 453	4	1, 357
West Virginia	24, 097	7, 419	9, 000	----------	4, 121	2, 879	215	463
Wisconsin	16, 492	1, 864	----------	12	7, 400	4, 896	619	1, 701
Wyoming	3, 024	145	----------	999	490	571	35	784
Total	806, 688	133, 479	103, 847	48, 148	224, 552	134, 302	83, 196	79, 164

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TABLE 543.—*Total State highway road and bridge disbursement, 1926, as reported by State authorities*

States	Total disbursements	Construction	Maintenance	Miscellaneous expenses	Retirement of bonds	Interest on bonds	Equipment, material, etc.	County funds, right of way, traffic, etc.
	1,000 dollars	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*
Alabama	10,290	6,854	418	814	868	798	538	
Arizona	2,565	1,342	923	165			127	8
Arkansas	9,563	3,785	1,094	303			1,381	3,000
California	21,095	9,896	4,285	1,419	1,775	3,115	336	269
Colorado	5,850	3,513	787	479	630	411	25	5
Connecticut	10,501	3,339	6,721	414				
Delaware	3,469	2,421	133	106	245	400	30	134
Florida	13,657	10,736	1,863	844			214	
Georgia	9,565	6,695	1,521	956			335	58
Idaho	4,191	2,591	535	364	30	163	422	83
Illinois	24,267	14,008	1,531	2,388	2,000	3,511	330	499
Indiana	12,429	8,494	2,301	608			895	131
Iowa	15,272	8,097	3,673	766	1,986	170		580
Kansas	9,171	6,720	2,000	451				
Kentucky	9,820	6,953	1,030	751		480	205	401
Louisiana	10,563	7,340	2,605	443	28	27		120
Maine	10,279	6,983	1,783	412	179	492	291	139
Maryland	10,598	3,651	3,953		2,003	991		
Massachusetts	13,794	7,189	2,000	1,214	521	208	142	2,490
Michigan	25,998	11,291	2,411	2,988	1,845	2,625	1,579	3,259
Minnesota	17,979	10,171	2,802	130	159	1,597	2,624	496
Mississippi	4,698	2,828	1,619	151			53	47
Missouri	30,841	23,620	1,914	1,655	2,005	1,647		
Montana	1,155	872	98	169			6	10
Nebraska	7,639	5,510	1,592	254			205	48
Nevada	1,699	983	282	186	100	32	86	30
New Hampshire	3,017	1,189	1,320	448			60	
New Jersey	24,378	12,104	1,618	2,670	1,374	892	51	5,669
New Mexico	2,928	1,599	930	133	20	114	132	
New York	41,781	21,107	7,956	2,578	400	4,240	378	5,122
North Carolina	37,216	21,425	4,630	2,173		3,402	4,900	686
North Dakota	1,978	1,325	161	430			53	
Ohio	29,496	14,003	14,773	720				
Oklahoma	10,420	7,985	1,769	659				7
Oregon	10,019	4,260	2,290	264	1,197	1,723		285
Pennsylvania	50,913	26,417	13,238	3,153	1,110	3,891	652	2,452
Rhode Island	3,871	1,506	1,284	263	42	116	520	140
South Carolina	9,640	6,287	1,150	347			1,524	332
South Dakota	5,843	3,241	1,174	653	450	296	22	7
Tennessee	14,037	7,627	2,099	1,247		24	3,040	
Texas	19,659	10,414	8,445	325			475	
Utah	2,448	924	504	112	412	325	166	5
Vermont	3,713	2,050	1,417	122			124	
Virginia	12,014	7,029	2,816	575			241	1,353
Washington	8,825	5,865	2,038	689				233
West Virginia	17,492	11,020	2,031	555	2,000	1,883		
Wisconsin	12,131	6,426	3,367	393			79	1,866
Wyoming	2,974	1,502	641	167	500	117	47	
Total	621,744	351,220	125,618	37,175	21,879	33,090	22,288	29,874

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TABLE 544.—*Motor-vehicle registration, 1926, as reported by State authorities*

State	Registered motor vehicles (private and commercial)			Registered motor cycles	Tax-exempt motor cars	Number of licenses and permits		Year's increase in registration	
	Grand total motor cars and trucks	Passenger autos, taxis, and busses	Motor trucks and road tractors			Dealers' licenses	Operators and chauffeurs	Number	Per cent
Alabama	225, 930	197, 983	27, 947	401	167	447	1, 813	31, 350	16. 1
Arizona	73, 682	63, 294	10, 388	337	851	232	86, 413	5, 653	8. 3
Arkansas	209, 419	179, 480	29, 939	279	668	527	5, 131	25, 830	14. 1
California	1, 600, 475	1, 384, 152	216, 323	10, 363	21, 465	3, 194	112, 170	159, 934	11. 1
Colorado	248, 613	227, 708	20, 905	1, 480	283	3, 400	29, 729	8, 510	3. 5
Connecticut	263, 235	222, 283	40, 952	3, 108	2, 397	5, 231	292, 253	12, 566	5. 0
Delaware	44, 834	36, 246	8, 588	342	44	630	49, 155	4, 694	11. 7
Florida	401, 562	331, 892	69, 670	1, 390	3, 001	3, 295	10, 854	115, 174	40. 2
Georgia	277, 468	241, 949	35, 519	841	934	864	3, 197	29, 375	12. 3
Idaho	94, 760	86, 339	8, 421	483	1, 228	402	414	13, 254	16. 3
Illinois	1, 370, 503	1, 195, 897	174, 606	6, 156	979	4, 703	93, 368	107, 326	8. 5
Indiana	772, 326	665, 126	107, 200	3, 738	6, 777	2, 189	39, 828	46, 916	6. 5
Iowa	698, 998	648, 218	50, 780	1, 934	2, 744	2, 291	11, 047	39, 796	6. 0
Kansas	491, 276	441, 373	49, 903	1, 330	2, 342	2, 534	---------	34, 243	7. 5
Kentucky	281, 557	252, 632	28, 925	672	1, 534	1, 162	9, 299	19, 910	7. 6
Louisiana	239, 500	204, 000	35, 500	500	209	---------	---------	32, 500	15. 7
Maine	151, 486	124, 158	27, 328	1, 124	1, 114	1, 210	180, 244	10, 987	7. 8
Maryland	252, 852	240, 743	12, 109	4, 039	1, 969	6, 027	77, 754	18, 605	7. 9
Massachusetts	690, 190	593, 234	96, 956	9, 215	1, 456	2, 134	763, 951	44, 037	6. 8
Michigan	1, 118, 785	969, 686	149, 099	3, 438	6, 246	2, 133	306, 079	129, 775	13. 1
Minnesota	630, 285	559, 128	71, 157	2, 551	558	2, 193	---------	60, 591	10. 6
Mississippi	205, 200	184, 133	21, 067	92	74	5, 468	---------	27, 988	16. 3
Missouri	654, 554	587, 856	66, 698	2, 005	1, 661	2, 293	30, 175	50, 388	8. 3
Montana	103, 958	88, 840	15, 118	192	1, 255	447	384	9, 302	9. 8
Nebraska	366, 773	337, 989	28, 784	1, 268	226	2, 834	---------	28, 054	8. 8
Nevada	24, 014	19, 300	4, 714	82	421	110	---------	2, 845	13. 4
New Hampshire	89, 001	78, 400	10, 601	1, 444	322	484	99, 150	7, 503	9. 2
New Jersey	651, 415	531, 702	119, 713	7, 235	5, 959	2, 460	745, 659	70, 861	12. 2
New Mexico	54, 996	53, 173	1, 823	200	683	145	---------	5, 885	12. 0
New York	1, 815, 434	1, 508, 314	307, 120	18, 303	12, 513	4, 414	2, 123, 309	189, 851	11. 7
North Carolina	385, 047	352, 217	32, 830	870	4, 539	8, 157	---------	44, 760	13. 1
North Dakota	157, 822	145, 571	12, 251	305	125	---------	---------	12, 850	8. 9
Ohio	1, 480, 246	1, 295, 020	185, 226	12, 130	9, 780	3, 777	4, 703	133, 846	9. 9
Oklahoma	499, 938	449, 955	49, 983	719	530	---------	---------	75, 593	17. 8
Oregon	233, 568	214, 946	18, 622	2, 123	1, 895	604	60, 005	17, 015	7. 9
Pennsylvania	1, 455, 184	1, 264, 453	190, 731	13, 672	4, 430	28, 167	1, 637, 188	124, 751	9. 4
Rhode Island	110, 746	91, 798	18, 948	1, 303	633	278	126, 630	8, 990	8. 8
South Carolina	181, 189	163, 551	17, 638	270	5, 139	519	152	12, 693	7. 5
South Dakota	168, 230	153, 840	14, 390	249	853	1, 051	---------	202	. 1
Tennessee	279, 639	254, 342	25, 297	751	2, 198	599	---------	35, 013	14. 3
Texas	1, 049, 869	944, 905	104, 964	2, 679	2, 505	3, 635	10, 978	74, 786	7. 7
Utah	85, 380	72, 880	12, 500	576	878	---------	---------	11, 953	16. 3
Vermont	74, 063	68, 524	5, 539	606	28	700	79, 586	4, 487	6. 4
Virginia	322, 614	273, 764	48, 850	2, 125	3, 692	3, 915	8, 700	39, 964	14. 1
Washington	363, 279	310, 386	52, 893	3, 740	4, 897	4, 914	427, 507	34, 837	10. 6
West Virginia	227, 836	201, 645	26, 191	1, 273	2, 040	12, 011	87, 355	10, 247	4. 7
Wisconsin	662, 282	581, 994	80, 288	3, 107	578	2, 785	681, 800	67, 806	11. 4
Wyoming	49, 883	44, 358	5, 525	179	421	293	---------	2, 172	4. 6
District of Columbia	111, 497	97, 794	13, 703	1, 327	2, 843	1, 906	70, 140	8, 405	8. 2
Total	22, 001, 393	19, 237, 171	2, 764, 222	131, 546	[1] 135,941	137, 064	8, 266, 126	2, 064, 119	10. 3

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[1] Includes 7,859 United States cars not allocated to States.

TABLE 545.—*Motor-vehicle revenues, 1926,*[1] *as reported by State authorities*

State	Total gross receipts	Motor car registration receipts			Miscellaneous receipts [2]	Disposition of gross receipts			
		All motor cars	Passenger cars and busses	Trucks, etc.		Collection costs	State highways	Local roads	On road bonds and miscellaneous
	1,000 dollars	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*
Alabama	2,889	2,873			16	111	551	560	1,667
Arizona	468	422			46	18	450		
Arkansas	3,656	3,611			45	73	1,176	664	1,803
California	8,477	7,201	4,528	2,673	1,276	1,564	3,721	3,192	
Colorado	1,507	1,456	1,229	227	52	75	716	716	
Connecticut	6,221	4,752	3,676	1,076	1,469		6,221		
Delaware	776	593	425	168	183		776		
Florida	6,764	6,703			61	122	4,957	1,685	
Georgia	3,382	3,323	2,769	554	59	120	3,262		
Idaho	1,386	1,344	1,128	216	41		143	1,243	
Illinois	14,047	13,108	9,996	3,112	939		8,536		5,511
Indiana	5,093	4,744	3,683	1,061	349	270	4,823		
Iowa	10,208					357	9,851		
Kansas	4,803					248	2,667	1,888	
Kentucky	4,132	4,008	3,143	865	124	175	3,525	432	
Louisiana	3,993	3,836			157	93	3,846		54
Maine	2,355	1,804	1,425	379	551	300	1,401		654
Maryland	2,928	2,271	1,994	277	657	293	2,108		527
Massachusetts	13,078	10,586	7,135	3,451	2,492	1,029	12,049		
Michigan	16,954	15,469	11,648	3,821	1,485	1,208	9,746	6,000	
Minnesota	9,977	9,856	8,077	1,779	121		6,367		3,610
Mississippi	1,973	1,966	1,787	179	7	59		1,914	
Missouri	7,903					1,391	2,860		3,652
Montana	1,029	896	752	144	133	40		989	
Nebraska	3,636	3,464	2,956	508	172	97	1,062	2,477	
Nevada	210	210				13	65	132	
New Hampshire	1,711	1,343			368	96	1,615		
New Jersey	11,871	8,503	5,135	3,368	3,368	240	7,456	4,175	
New Mexico	514	490	487	3	24	38	317	159	
New York	28,786	25,737	18,064	7,673	3,049	2,166	19,581	4,312	2,727
North Carolina	[1] 9,400					150	9,250		
North Dakota	1,578	1,546	1,355	191	32	280	619	619	
Ohio	9,819	1,480			8,339		4,910	4,909	
Oklahoma	5,515					40	2,166	3,309	
Oregon	6,018	5,815	4,998	817	203	200	4,363	1,455	
Pennsylvania	24,045	18,338	12,746	5,592	5,707	3,056	15,988		5,001
Rhode Island	1,963	1,563	1,154	409	400	175	1,788		
South Carolina	1,952	1,870	1,589	281	82	177	1,772	3	
South Dakota	2,429	2,402	2,106	296	27	48	1,215	1,166	
Tennessee	3,591					214	1,688	1,689	
Texas	14,363						10,487	3,876	
Utah	634						57		577
Vermont	1,697	1,448	1,249	199	249	86	1,611		
Virginia	4,625	4,252	3,613	639	373	273	4,352		
Washington	6,056	5,472	4,267	1,205	584	650	4,548	858	
West Virginia	3,720	3,287	2,772	515	443	279	1,201		2,240
Wisconsin	9,075	8,684	7,208	1,476	391	550	5,215	3,310	
Wyoming	500	489	394	95	11				500
District of Columbia	566	121	99	22	445	228			338
Total	288,282				(2)	16,602	191,111	51,702	28,867

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[1] All States report for calendar year, except North Carolina which reports for last six months.
[2] This column not totaled as only partially reported.

TABLE 546.—*Gasoline taxes, 1926, as reported by State authorities*

State	Total tax earnings, with refunds deducted	Disposition of total tax earnings					Gasoline, consumed by motor vehicles	Tax rates per gallon
		Collection costs	Construction, etc.		State and county road bond payments	Miscellaneous uses		
			State highways	Local roads				
	1,000 dollars	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 dollars*	*1,000 gallons*	*Cents*
Alabama	2,559	10		2,549			127,932	2
Arizona	978		489	489			32,609	3
Arkansas	3,585		1,992	684	909		89,633	4
California	16,502		8,251	8,251			825,106	2
Colorado	2,092		1,046	1,046			104,587	2
Connecticut	2,689		2,689				134,469	2-
Delaware	390		390				19,521	2
Florida	11,431	8	8,567	2,856			285,787	4
Georgia	5,653	4	2,421	1,614		1,614	161,518	3½
Idaho	1,122	7	1,115				37,404	3
Illinois [1]							[2] 650,000	0
Indiana	8,972	12	5,973	2,987			299,058	3
Iowa	4,842	10	1,611	3,221			242,121	2
Kansas	4,303		3,576	727			215,169	2
Kentucky	4,935		4,935				103,478	3-5
Louisiana	2,709		2,709				135,428	2
Maine	1,823	10	1,511	302			60,091	3
Maryland	2,294	3	1,833			458	114,693	2
Massachusetts [1]							[2] 280,000	0
Michigan	10,082	24	4,764	1,212	4,082		504,089	2
Minnesota	4,805		4,805				240,234	2
Mississippi	4,088	3	1,940	1,991	51	103	105,887	3-4
Missouri	5,661	55	5,606				283,057	2
Montana	871		131	478		262	43,536	2
Nebraska	3,040	7	3,033				151,996	2
Nevada	406		203	203			10,146	4
New Hampshire	769		769				38,429	2
New Jersey [1]							[2] 255,000	0
New Mexico	763	25	738				25,428	3
New York [1]							[2] 720,000	0
North Carolina	7,786		7,786				194,662	4
North Dakota	989		820			169	73,690	1-2
Ohio	13,257		5,966	3,314		3,977	662,863	2
Oklahoma	6,212		4,141	2,071			207,080	3
Oregon	3,334	8	3,326				118,494	3
Pennsylvania	11,782		8,709	2,903		170	588,370	2
Rhode Island	512		512				51,190	1
South Carolina	4,497		2,698	1,799			89,939	5
South Dakota	1,925		1,925				64,159	3
Tennessee	3,852	38	3,814				128,417	3
Texas	5,227		3,920			1,307	522,689	1
Utah	1,258	4	1,057		197		35,943	3½
Vermont	553		553				27,655	2
Virginia	5,856	1	3,903	1,952			135,814	3-4½
Washington	3,482		3,482				174,105	2
West Virginia	2,923		2,923				83,505	3½
Wisconsin	5,210	10	2,239	2,961			200,400	2
Wyoming	569		569				22,744	2½
District of Columbia	1,015					1,015	50,760	2
Total	187,603	239	129,440	43,610	5,239	9,075	9,788,984	Av. 2.38

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[1] State assessed no gasoline tax during year.

[2] Estimated consumption.

TABLE 547.—*National forests: Net areas, by States, June 30, 1927*

State and forest	Net area
	Acres
Alabama	122, 739
Alabama	[1] 107, 389
McClellan	15, 350
Alaska	21, 340, 392
Chugach	4, 792, 634
Tongas	16, 547, 758
Arizona	11, 336, 462
Apache [2]	677, 392
Coconino	1, 717, 744
Coronado [2]	1, 356, 983
Crook	1, 425, 166
Kaibab	723, 411
Prescott	1, 207, 706
Sitgreaves	673, 921
Tonto	2, 261, 147
Tusayan	1, 292, 992
Arkansas	982, 754
Ouachita	[1] 665, 784
Ozark	[1] 316, 970
California	18, 971, 409
Angeles	646, 312
California	822, 996
Cleveland	380, 569
Crater [2]	48, 218
Eldorado [2]	551, 478
Inyo [2]	1, 525, 248
Klamath [2]	1, 524, 873
Lassen	914, 932
Modoc	1, 475, 759
Mono [2]	796, 219
Plumas	1, 109, 600
San Bernardino	597, 359
Santa Barbara	1, 775, 076
Sequoia	1, 342, 430
Shasta	870, 034
Sierra	1, 193, 513
Siskiyou [2]	329, 384
Stanislaus	811, 202
Tahoe [2]	515, 657
Trinity	1, 410, 460
Colorado	13, 234, 380
Arapaho	636, 508
Cochetopa	908, 787
Colorado	828, 744
Grand Mesa	659, 384
Gunnison	905, 265
Hayden [2]	65, 769
Holy Cross	1, 125, 174
La Sal [2]	26, 631
Leadville	927, 413
Montezuma	697, 582
Pike	1, 087, 115
Rio Grande	1, 135, 764
Routt	750, 254
San Isabel	599, 416
San Juan	1, 241, 720
Uncompahgre	754, 201
White River	884, 505
Florida: Florida	343, 180
Georgia	273, 505
Benning	78, 560
Cherokee [2]	105, 162
Nantahala [2]	89, 783
Idaho	19, 097, 780
Boise	1, 063, 313
Cache [2]	491, 449
Caribou [2]	703, 459
Challis	1, 272, 023
Clearwater	793, 178
Coeur d'Alene	657, 873
Idaho	1, 688, 056
Kaniksu [2]	192, 264
Lemhi	1, 358, 772
Minidoka [2]	520, 549
Nezperce	1, 661, 503
Payette	1, 307, 555
Pend Oreille	676, 572
St. Joe	555, 114
Salmon	1, 708, 374
Sawtooth	1, 158, 262
Selway	1, 689, 157
Targhee [2]	1, 031, 371
Weiser	565, 945
Illinois: Bellevue-Savanna	10, 710
Kentucky: Knox	22, 660
Maine: White Mountain [2]	32, 265
Maryland: Meade	4, 725
Michigan: Michigan	126, 762
Minnesota	1, 001, 042
Minnesota	191, 025
Superior	810, 017
Montana	15, 919, 690
Absaroka	851, 046
Beartooth	660, 112
Beaverhead	1, 339, 172
Bitterroot	1, 047, 071
Blackfeet	832, 566
Cabinet	829, 653
Custer [2]	517, 703
Deerlodge	828, 834
Flathead	1, 710, 112
Gallatin	581, 002
Helena	682, 482
Jefferson	1, 010, 310
Kootenai	1, 351, 165
Lewis and Clark	810, 731
Lolo	851, 249
Madison	953, 456
Missoula	1, 024, 026
Nebraska: Nebraska	205, 946
Nevada	4, 979, 146
Dixie [2]	56, 324
Eldorado [2]	400
Humboldt	1, 322, 313
Inyo [2]	60, 416
Mono [2]	464, 502
Nevada	1, 175, 128
Tahoe	16, 373
Toiyabe	1, 883, 690
New Hampshire: White Mountain [2]	427, 325
New Jersey: Dix	6, 785
New Mexico	8, 508, 539
Apache [2]	886, 861
Carson	1, 088, 603
Coronado [2]	124, 828
Datil	1, 748, 654
Gila	1, 596, 229
Lincoln	1, 113, 559
Manzano	679, 610
Santa Fe	1, 270, 195
New York: Pine Plains	9, 800
North Carolina	376, 183
Cherokee [2]	
Nantahala [2]	[3] 117, 094
Pisgah [2]	[3] 259, 089
Unaka [2]	
Oklahoma: Wichita	61, 480
Oregon	13, 238, 092
Cascade	1, 023, 800
Crater [2]	805, 088
Deschutes	1, 296, 142
Fremont	849, 286
Klamath [2]	8, 723
Malheur	1, 018, 666
Mount Hood	1, 059, 852
Ochoco	718, 137
Santiam	610, 918
Siskiyou [2]	1, 032, 750
Siuslaw	549, 774
Umatilla [2]	920, 897
Umpqua	1, 014, 174
Wallowa	961, 701
Whitman	1, 338, 184
Pennsylvania	235, 376
Allegheny	214, 506
Tobyhanna	20, 870
Porto Rico: Luquillo	12, 443
South Carolina	61, 267
Jackson	20, 225
Nantahala [2]	41, 042
South Dakota	1, 062, 581
Black Hills [2]	475, 481
Custer [2]	73, 606
Harney	513, 494
Tennessee	322, 790
Cherokee [2]	190, 238
Pisgah [2]	19, 679
Unaka [2]	112, 873
Utah	7, 484, 522
Ashley [2]	980, 332
Cache [2]	283, 801
Dixie [2]	795, 630
Fishlake	1, 386, 459
La Sal [2]	504, 291
Manti	725, 476
Minidoka [2]	70, 635
Powell	1, 051, 505
Uinta	1, 076, 620
Wasatch	609, 767

[1] Figures include acreage actually acquired under the Weeks law.
[2] Forest lies in more than one State.
[3] Nantahala includes 3,302 acres and Pisgah 8,067 acres transferred from the Treasury Department.

TABLE 547.—*National forests: Net areas, by States, June 30, 1927*—Continued

State and forest	Net area	State and forest	Net area	State and forest	Net area
	Acres		*Acres*		*Acres*
Virginia	588, 866	Washington—Con.		Wyoming	8, 548, 234
Eustis	4, 220	Colville	747, 142	Ashley [2]	6, 460
Humphreys	3, 184	Kaniksu [2]	273, 163	Bighorn	1, 125, 632
Lee	7, 177	Mount Baker	1, 460, 651	Black Hills [2]	147, 003
Monongahela [2]	10, 414	Olympic	1, 529, 501	Caribou [2]	6, 315
Natural Bridge	157, 246	Rainier	1, 261, 558	Hayden [2]	327, 784
Shenandoah [2]	361, 416	Snoqualmie	612, 095	Medicine Bow	552, 275
Unaka [2]	45, 209	Umatilla [2]	313, 359	Shoshone	1, 619, 796
		Wenatchee	860, 405	Targhee [2]	345, 570
Washington	9, 625, 266	West Virginia	225, 328	Teton	1, 881, 212
Chelan	1, 807, 962	Monongahela [2]	165, 639	Washakie	867, 899
Columbia	759, 430	Shenandoah [2]	59, 689	Wyoming	1, 668, 288
				Total (159 national forests)	158, 800, 424

TOTAL NET AREA OF NATIONAL FORESTS EXTENDING INTO TWO OR MORE STATES

Forest	States	Total net area	Forest	States	Total net area
	Number	*Acres*		*Number*	*Acres*
Apache	2	1, 564, 253	Klamath	2	1, 533, 596
Ashley	2	986, 782	La Sal	2	530, 922
Black Hills	2	622, 484	Minidoka	2	591, 184
Cache	2	778, 250	Mono	2	1, 260, 721
Caribou	2	709, 774	Monongahela	2	176, 053
Cherokee	3	295, 400	Nantahala	3	247, 919
Coronado	2	1, 481, 811	Pisgah	2	278, 768
Crater	2	853, 306	Shenandoah	2	421, 105
Custer	2	591, 309	Siskiyou	2	1, 362, 134
Dixie	2	851, 954	Tahoe	2	532, 030
Eldorado	2	551, 878	Targhee	2	1, 376, 941
Hayden	2	393, 553	Umatilla	2	1, 234, 256
Inyo	2	1, 585, 664	Unaka	3	158, 082
Kaniksu	2	465, 427	White Mountain	2	459, 581

Forest Service in cooperation with the General Land Office.

[2] Forest lies in more than one State.

TABLE 548.—*Crossties: Number purchased, by kinds of wood and average cost per tie, 1905, 1909, 1923, and 1925*

Kind of wood	Crossties purchased				Average cost per tie			
	1905	1909	1923	1925	1905	1909	1923	1925
	Number	*Number*	*Number*	*Number*	*Cents*	*Cents*	*Cents*	*Cents*
Beech	34, 227	195, 000	2, 279, 221	1, 619, 179	40	36	96	102
Birch	35, 500		369, 154	1, 803, 081	40		83	102
Cedar	6, 962, 827	6, 777, 000	3, 676, 228	3, 432, 131	41	46	86	83
Chestnut	4, 717, 604	6, 629, 000	4, 419, 782	3, 070, 116	48	44	95	93
Cypress	3, 483, 746	4, 589, 000	5, 243, 835	5, 099, 968	33	41	104	110
Douglas fir	3, 633, 276	9, 067, 000	15, 316, 571	12, 708, 863	33	41	86	65
Gum		378, 000	3, 050, 798	3, 731, 112		52	73	65
Hemlock	1, 713, 090	2, 642, 000	3, 477, 740	1, 970, 648	33	33	80	77
Lodgepole pine	(1)	487, 000	949, 451	(1)	(1)	46	82	(1)
Maple	25, 500	158, 000	3, 035, 007	3, 110, 521	40		95	95
Oak	34, 677, 304	57, 132, 000	62, 915, 237	47, 255, 588	55	51	103	96
Redwood	590, 852	2, 088, 000	2, 492, 445	1, 202, 614	20	53	95	71
Southern pine	18, 351, 037	21, 385, 000	22, 049, 467	20, 421, 350	42	52	91	90
Tamarack and larch	3, 371, 202	3, 311, 000	4, 220, 194	2, 447, 419	37	41	64	74
Western yellow pine	(1)	6, 797, 000	1, 339, 507	(1)	(1)	53	82	(1)
All other	385, 062	2, 116, 000	1, 141, 480	3, 469, 169	43			
Total	[2] 77, 981, 227	123, 751, 000	135, 976, 117	111, 341, 759		49	95	88

Bureau of the Census in cooperation with the Forest Service. Compiled from U. S. Dept. Agr., Statist. Bull. No. 21.

[1] Included with Southern pine.

[2] Steam railroads only.

TABLE 549.—*National forests: Grazing—range capacity, stock grazed, and receipts, by States, 1926*

State and district	Range capacity [1]			Stock actually grazed			Receipts from grazing [2]
	Cattle and horses	Sheep and goats	Swine	Cattle and horses	Sheep and goats	Swine	
	Number	*Number*	*Number*	*Number*	*Number*	*Number*	*Dollars*
Alabama	2,000	----------	----------	21	----------	----------	77
Arizona	285,195	259,277	----------	236,119	260,865	271	112,033
Arkansas	67,890	121,970	169,865	482	10	38	521
California	218,982	518,357	----------	169,490	424,887	266	173,971
Colorado	388,958	1,084,830	----------	287,498	956,433	----------	271,272
Florida	7,500	18,700	17,000	317	455	5	340
Georgia	3,005	1,230	1,743	----------	----------	----------	138
Idaho	166,203	1,543,331	----------	141,930	1,303,215	----------	206,196
Maine	26	----------	----------	----------	----------	----------	9
Montana	170,123	602,557	----------	138,766	566,385	----------	121,885
Nebraska	16,000	----------	----------	10,218	----------	----------	10,925
Nevada	77,803	370,479	----------	61,194	299,406	----------	86,804
New Hampshire	324	----------	----------	181	----------	----------	114
New Mexico	158,386	344,076	----------	95,123	220,449	180	86,025
North Carolina	4,592	1,887	3,535	468	211	140	396
Oklahoma	3,135	----------	----------	2,601	----------	----------	3,163
Oregon	140,415	666,607	----------	100,514	631,331	10	132,770
Pennsylvania	500	----------	----------	----------	----------	----------	----------
South Carolina	445	236	349	----------	----------	----------	31
South Dakota	39,574	15,965	----------	24,317	17,458	----------	16,392
Tennessee	2,751	590	685	100	52	----------	186
Utah	157,019	757,246	----------	125,888	732,663	168	164,997
Virginia	7,490	2,435	465	1,024	127	----------	641
Washington	31,356	261,203	----------	13,992	173,880	----------	37,480
West Virginia	2,777	7,487	353	390	1,322	7	418
Wyoming	150,320	701,893	----------	103,576	639,144	----------	104,148
All other [3]	----------	----------	----------	45	30	----------	----------
Total	2,102,769	7,280,356	193,995	1,514,254	6,228,323	1,085	1,530,052

SUMMARY BY ADMINISTRATIVE DISTRICTS

State and district	Range capacity: Cattle and horses	Range capacity: Sheep and goats	Range capacity: Swine	Stock grazed: Cattle and horses	Stock grazed: Sheep and goats	Stock grazed: Swine	Receipts from grazing
District 1	185,276	796,917	----------	144,629	640,152		139,609
District 2	491,202	1,481,750	----------	387,214	1,370,332		363,372
District 3	439,981	600,353	----------	328,195	479,164		195,875
District 4	490,683	2,767,000	----------	367,192	2,506,370	168	477,294
District 5	220,507	553,451	----------	169,490	421,887	266	181,361
District 6	172,685	926,350	----------	114,506	805,211	10	170,567
District 7	102,435	154,535	193,995	3,016	2,177	190	2,871
District 8	----------	----------	----------	12	30		

Forest Service.

[1] Carrying capacity is as of 1924. [2] Receipts are for the fiscal year of 1927. [3] Alaska and New Jersey.

TABLE 550.—*Production of lumber, by States, 1899, 1909, 1919, 1924–1926*

State	1899	1909	1919	1924		1926
	M ft. b. m.	*M ft. b. m.*	*M ft. b. m.*	*M ft. b. m.*	*M ft. b. m.*	*M ft. b. m.*
Alabama	1,101,386	1,691,001	1,798,746	1,873,403	2,235,738	2,105,122
Arizona	36,182	62,731	73,655	142,512	145,609	115,232
Arkansas	1,623,987	2,111,300	1,772,157	1,536,255	1,597,130	1,441,018
California	737,035	1,143,507	1,259,363	[1] 1,996,496	[1] 2,042,991	[1] 2,187,959
Colorado	133,746	141,710	64,864	42,014	71,069	75,278
Connecticut	108,093	168,371	86,708	48,209	41,650	47,367
Delaware	35,955	55,440	27,437	13,851	7,324	9,433
Florida	790,373	1,201,734	1,137,432	1,089,429	1,063,876	920,585
Georgia	1,311,917	1,342,249	893,965	1,206,599	1,365,174	1,145,489
Idaho	65,363	645,800	765,388	1,017,960	1,140,575	947,471
Illinois	388,469	170,181	64,028	32,623	29,456	38,357
Indiana	1,036,999	556,418	282,487	193,391	178,560	139,472
Iowa	352,411	132,021	18,493	12,148	(2)	(2)
Kansas	10,665	4,716	2,840	[3] 5,550	(2)	(2)
Kentucky	774,651	860,712	512,078	193,879	207,278	216,759
Louisiana	1,115,366	3,551,918	3,163,871	3,396,940	3,293,091	2,889,530
Maine	784,647	1,111,565	596,116	369,615	330,103	340,893
Maryland	183,711	267,939	113,362	68,110	88,963	68,441
Massachusetts	344,190	361,200	166,841	129,619	109,625	86,168
Michigan	3,018,338	1,889,724	875,891	793,636	797,610	663,344
Minnesota	2,342,338	1,561,508	699,639	527,962	578,703	471,090
Mississippi	1,206,265	2,572,669	2,390,135	2,806,975	3,127,678	2,894,991
Missouri	723,754	660,159	321,383	188,426	186,789	178,568
Montana	255,685	308,582	287,378	350,335	388,854	378,693
Nebraska	4,655	(2)	505	(4)	----------	----------
Nevada	725	(2)	20,335	(5)	(5)	(5)
New Hampshire	572,447	649,606	338,777	265,474	260,680	243,007
New Jersey	74,118	61,620	36,888	12,542	9,816	6,953
New Mexico	30,880	91,987	86,808	125,422	152,330	127,110
New York	878,448	681,440	357,764	237,581	197,654	170,963
North Carolina	1,286,638	2,177,715	1,654,435	1,071,912	1,040,735	970,965
Ohio	990,497	542,904	280,076	155,016	140,736	141,409
Oklahoma	22,104	225,730	168,403	154,503	157,580	149,929
Oregon	734,538	1,898,995	2,577,403	3,665,547	4,216,383	4,454,735
Pennsylvania	2,333,278	1,462,771	630,471	343,049	330,822	318,707
Rhode Island	18,528	25,489	11,030	3,759	3,686	5,426
South Carolina	466,429	897,660	621,679	878,517	980,289	920,825
South Dakota	[6] 33,734	31,057	42,970	51,465	46,779	49,281
Tennessee	950,958	1,223,849	792,132	658,888	642,359	683,323
Texas	1,232,404	2,099,130	1,379,774	1,528,490	1,578,008	1,456,121
Utah	17,548	12,638	11,917	7,378	5,861	6,479
Vermont	375,809	351,571	218,479	126,884	126,433	111,638
Virginia	959,119	2,101,716	1,098,038	696,054	709,180	676,663
Washington	1,429,032	3,862,916	4,961,220	6,267,343	7,027,325	7,546,239
West Virginia	778,051	1,472,942	763,103	614,280	583,353	588,788
Wisconsin	3,380,166	2,025,038	1,116,338	1,016,506	1,068,612	912,521
Wyoming	16,963	28,602	8,674	14,430	16,105	19,392
All other	[7] 6,571	[8] 11,230	----------	----------	16,069	14,003
United States	[9] 35,084,166	44,509,761	[9, 10] 34,552,076	[11, 12] 35,930,986	[1, 12] 38,338,641	[1, 12] 36,935,930

SUMMARY BY LUMBER PRODUCING REGIONS

REGIONS						
Northeastern	5,709,224	5,197,012	2,583,873	1,018,693	1,506,756	1,400,089
Lake	8,749,842	5,476,270	2,691,868	2,338,104	2,444,925	2,046,958
Central	5,643,379	5,487,165	3,015,887	2,036,512	1,968,531	1,986,766
North Carolina pine	2,712,186	5,177,091	3,374,152	2,646,483	2,730,204	2,568,463
Southern pine	8,403,802	14,795,731	12,704,483	13,592,594	14,418,275	13,002,788
North Pacific	2,163,570	5,761,911	7,538,623	9,932,890	11,243,708	12,000,974
South Pacific	737,760	1,143,507	1,279,698	1,996,496	2,012,991	2,187,959
N. Rocky Mountain	321,048	954,382	1,052,766	1,368,295	1,529,429	1,326,169
S. Rocky Mountain	235,319	337,668	245,918	331,756	300,074	343,491
Prairie	[13] 408,036	[13] 179,024	64,808	69,163	[13] 62,848	[13] 63,283

Forest Service in cooperation with Bureau of the Census.

[1] Includes cut of Nevada.
[2] Included in "All other."
[3] Includes cut of Nebraska.
[4] Included with Kansas.
[5] Included with California.
[6] Includes cut of North Dakota.
[7] Reported as cut of Alaska.
[8] Includes cut of Nebraska and Nevada.
[9] Includes both merchant and custom sawing.
[10] Includes 2,655 mills cutting less than 50,000 feet each per year.
[11] Mills cutting less than 50,000 feet each year excluded.
[12] Excludes custom mills.
[13] Includes "All other."

TABLE 551.—*Distribution and consumption of domestic lumber, 1926* [1]

Source (numerals show region)	Softwoods: Shipments to other States	Softwoods: Shipments to foreign countries	Softwoods: Apparent [2] consumption	Hardwoods: Shipments to other States	Hardwoods: Shipments to foreign countries	Hardwoods: Apparent [2] consumption
	M ft. b. m.	*M ft. b. m.*	*M ft. b. m.*	*M ft. b. m.*	*M ft. b. m.*	*M ft. b. m.*
5 Alabama	1,131,708	56,238	805,920	222,449	28,122	41,476
9 Arizona	59,435		78,998			[3] 261
5 Arkansas	694,922	377	209,763	361,594	3,073	263,468
7 California	611,875	74,613	[3] 3,471,018	29		[3] 40,464
9 Colorado	27,316	33	[3] 227,006			[3] 4,636
1 Connecticut	3,016		[3] 194,857	3,563		[3] 50,580
1 Delaware			[3] 76,181			[3] 5,144
1 District of Columbia			[3] 84,740			[3] 5,436
5 Florida	288,917	105,204	661,376	14,057	59	[3] 21,469
5 Georgia	830,016	7,656	350,162	71,276	1,904	39,660
8 Idaho	841,273	643	224,578			[3] 270
3 Illinois	510		[3] 1,755,800	15,832	31	[3] 569,394
3 Indiana			[3] 514,216	35,057	1,772	[3] 301,954
10 Iowa			[3] 507,929	7,595	636	[3] 36,641
10 Kansas			[3] 340,139	3,321	96	[3] 36,093
3 Kentucky	2,606		[3] 251,691	113,245	1,321	199,769
5 Louisiana	1,555,262	203,641	516,644	500,711	62,404	174,645
1 Maine	182,277		150,797	16,654		17,611
1 Maryland			[3] 287,040	27,965		[3] 57,470
1 Massachusetts	1,373		[3] 597,941	12,236	2,674	[3] 112,333
2 Michigan	59,421	6,827	[3] 842,691	138,558	825	[3] 770,995
2 Minnesota	322,031	1,141	[3] 653,031			[3] 117,071
5 Mississippi	1,637,917	323,712	422,730	364,023	37,436	68,403
3 Missouri	26,719		[3] 617,469	76,688	650	[3] 141,203
8 Montana	190,992	689	241,628			[3] 380
10 Nebraska			[3] 257,283			[3] 6,429
7 Nevada	5,490		[3] 49,585			
1 New Hampshire	60,881		165,814	15,537		27,184
1 New Jersey	104		[3] 625,087			[3] 76,984
9 New Mexico	77,216		77,223			[3] 926
1 New York	8,664		[3] 2,407,068	32,734		[3] 425,183
4 North Carolina	477,230	465	458,267	83,079	1,921	[3] 217,431
10 North Dakota			[3] 127,702			[3] 2,268
3 Ohio			[3] 1,033,709	44,878	8,141	[3] 455,436
5 Oklahoma	70,267	12	[3] 431,237	2,873		[3] 16,078
6 Oregon	2,883,082	418,530	1,054,413			[3] 10,372
1 Pennsylvania	44,752		[3] 1,438,164	59,999	414	[3] 533,044
1 Rhode Island			[3] 117,951	1,882		[3] 12,260
4 South Carolina	658,261	5,135	151,368	124,519	3,167	26,742
10 South Dakota	24,620		[3] 136,508			[3] 1,215
3 Tennessee	85,366	1,291	[3] 319,003	345,809	16,244	322,308
5 Texas	497,073	81,982	[3] 1,342,958	110,265	7,912	115,296
9 Utah			[3] 126,975			[3] 1,254
1 Vermont	16,915		[3] 62,847	28,996	272	33,752
4 Virginia	291,801	7,508	[3] 426,147	163,230	17,073	130,468
6 Washington	4,564,950	1,193,922	1,533,665	298		[3] 7,095
3 West Virginia	94,595	653	[3] 146,958	351,398	11,434	143,997
2 Wisconsin	158,701	191	[3] 682,843	278,776	673	320,173
9 Wyoming	781		[3] 100,344			[3] 107
Total	18,488,335	2,490,403	27,357,464	3,629,126	208,904	5,973,428

SUMMARY BY LUMBER PRODUCING REGIONS

Source	Softwoods: Shipments to other regions	Softwoods: Shipments to foreign countries	Softwoods: Apparent consumption	Hardwoods: Shipments to other regions	Hardwoods: Shipments to foreign countries	Hardwoods: Apparent consumption
	M ft. b. m.	*M ft. b. m.*	*M ft. b. m.*	*M ft. b. m.*	*M ft. b. m.*	*M ft. b. m.*
1 Northeastern	6,589		[3] 6,208,487	23,286	3,360	[3] 1,356,981
2 Lake	344,475	8,159	[3] 2,178,565	253,439	1,498	[3] 1,208,839
3 Central	164,286	1,944	[3] 4,638,846	583,126	39,643	[3] 2,144,061
4 North Carolina pine	1,272,583	13,108	1,035,782	322,174	22,761	374,641
5 Southern pine	5,407,820	778,822	4,740,790	1,444,026	140,910	740,495
6 Pacific (north)	7,352,566	1,612,452	2,588,078	298		[3] 17,467
7 Pacific (south)	597,070	74,613	[3] 3,520,603	29		[3] 40,464
8 Rocky Mountain (north)	1,012,402	1,332	466,206			[3] 650
9 Rocky Mountain (south)	129,729	33	[3] 610,546			[3] 7,184
10 Prairie	7,525		[3] 1,369,561	10,839	732	[3] 82,646
Total	16,295,054	2,490,463	27,357,464	2,637,217	208,904	5,973,428

Forest Service in cooperation with the Bureau of the Census.

[1] These estimates indicate primary distribution—i. e., the shipments from producers to principal distributors—and in most instances do not take into account the secondary distribution which occurs from distributors to consumers.

[2] Estimates subject to modification on account of imports of foreign lumber, additions to and withdrawals from stocks, and secondary distribution across State or regional boundaries.

[3] Apparent consumption exceeds production.

TABLE 552.—*Lumber prices: Averages per M feet, f. o. b. mill, Douglas fir and southern yellow pine*

ANNUAL SUMMARY

Period	Douglas fir		Southern yellow pine		Period	Douglas fir		Southern yellow pine	
	Price	Price index 1913=100	Price	Price index 1913=100		Price	Price index 1913=100	Price	Price index 1913=100
	Dollars		*Dollars*			*Dollars*		*Dollars*	
1913	11.44	100.0	14.77	100.0	1921	19.98	174.7	21.18	143.4
1914	10.58	92.5	13.68	92.6	1922	23.90	208.9	26.44	179.0
1915	9.80	85.5	13.02	88.2	1923	28.93	252.9	30.81	208.6
1916	11.63	101.7	16.12	109.2	1924	23.14	202.3	28.16	190.7
1917	16.93	147.9	21.13	143.1	1925	21.63	189.1	28.31	191.7
1918	21.21	186.3	26.45	179.1	1926	21.13	184.7	[1] 26.83	181.7
1919	25.83	225.9	33.94	229.8	1927	20.42	178.5	25.62	173.5
1920	36.78	323.3	44.74	302.9					

DETAIL BY MONTHS

Period	Douglas fir price	Douglas fir price index	Southern yellow pine price	Southern yellow pine price index	Period	Douglas fir price	Douglas fir price index	Southern yellow pine price	Southern yellow pine price index
1920					1924				
January	41.98	366.0	52.21	353.5	January	28.30	247.4	29.40	199.1
February	46.31	404.8	57.94	392.3	February	26.33	230.2	30.16	204.1
March	46.66	407.0	61.60	417.1	March	24.69	215.8	29.83	202.0
April	43.15	377.1	57.53	389.5	April	24.39	213.2	29.14	197.3
May	40.21	351.2	54.65	370.0	May	22.40	195.8	27.55	186.5
June	36.05	315.1	40.05	271.2	June	22.99	201.0	27.36	185.2
July	33.69	294.5	41.34	279.9	July	21.93	191.7	25.91	175.4
August	32.86	287.2	43.42	294.0	August	22.42	196.0	27.77	188.0
September	31.29	273.4	41.09	278.2	September	21.58	188.6	29.46	199.5
October	27.57	241.0	34.44	233.2	October	21.10	184.5	26.71	180.8
November	24.05	210.0	26.67	180.6	November	21.48	187.7	25.81	174.7
December	22.61	197.6	25.88	175.2	December	21.82	190.7	30.13	204.0
1921					1925				
January	20.20	176.6	21.35	144.6	January	22.52	196.9	29.43	199.3
February	18.85	164.7	21.18	143.4	February	22.19	194.0	29.66	200.8
March	17.59	153.2	20.92	141.7	March	21.99	192.2	29.02	196.5
April	16.87	147.3	20.36	137.9	April	21.60	188.8	28.29	191.5
May	16.42	143.2	20.82	140.9	May	21.70	189.7	27.07	183.3
June	15.90	143.5	22.32	151.1	June	21.24	185.7	26.58	180.0
July	15.28	133.4	20.75	140.5	July	21.18	185.1	27.55	186.5
August	14.98	130.8	20.40	138.1	August	22.25	194.5	28.56	193.4
September	14.86	129.8	20.61	139.5	September	21.39	187.0	30.50	206.5
October	15.97	139.6	21.59	146.2	October	21.28	186.0	28.17	190.7
November	17.07	149.2	23.14	156.7	November	21.33	186.5	27.14	183.8
December	17.75	155.1	21.77	147.4	December	21.05	184.0	29.01	196.4
1922					1926				
January	18.73	163.7	22.68	153.6	January	22.29	194.8	27.66	187.3
February	22.75	198.9	22.61	153.1	February	21.41	187.2	28.29	191.5
March	22.40	195.8	22.27	151.5	March	21.70	189.7	27.14	183.8
April	20.44	178.7	22.78	154.2	April	21.62	189.0	26.33	178.3
May	21.10	184.4	24.85	168.2	May	21.19	185.2	26.04	176.3
June	23.24	203.1	29.07	196.8	June	21.34	186.5	26.93	182.3
July	24.18	211.3	27.19	184.9	July	21.25	185.8	25.80	174.7
August	24.83	217.0	28.47	192.8	August	21.04	183.9	26.58	180.0
September	27.13	237.2	31.24	211.5	September	20.73	181.2	25.78	174.5
October	27.97	244.5	31.71	214.7	October	20.68	180.8		
November	25.82	225.7	30.61	207.2	November	20.44	178.7	24.88	168.4
December	26.40	231.6	30.61	207.2	December	19.93	174.2	27.15	183.8
1923					1927				
January	28.54	249.5	30.42	205.9	January	19.72	172.4	27.08	183.3
February	29.42	257.2	32.81	222.1	February	19.73	172.5	26.85	181.8
March	30.22	264.2	33.71	228.2	March	19.82	173.3	26.08	176.6
April	31.46	275.0	33.38	226.0	April	20.50	179.2	26.11	176.8
May	31.02	271.2	33.85	229.2	May	20.47	178.9	25.92	175.5
June	30.36	265.4	32.40	219.4	June	20.36	178.0	26.04	176.3
July	27.68	241.9	31.14	210.8	July	20.29	177.4	26.33	178.3
August	26.97	235.7	30.82	208.6	August	20.30	177.4	24.12	163.3
September	27.18	237.5	27.53	186.4	September	19.89	173.9	23.77	160.9
October	27.24	238.1	28.77	194.7	October	20.09	175.6	24.00	162.5
November	28.97	253.2	27.83	188.4	November	19.53	170.7	22.78	154.2
December	26.94	235.5	26.56	179.8	December	19.24	168.2	22.15	150.0

Compiled in the Forest Service from reports of actual sales.

[1] Based on 11 months.

TABLE 553.—*Pulpwood consumption, by kinds of wood, by States: 1926*

State	Number of establishments	Total	Spruce		Hemlock		Yellow pine	Poplar	
			Domestic	Imported	Domestic	Imported		Domestic	Imported
		Cords	*Cords*	*Cords*	*Cords*	*Cords*	*Cords*	*Cords*	*Cords*
Maine	26	1,298,357	839,719	122,323	30,010	3,957		132,191	39,418
Wisconsin	41	1,224,443	340,188	71,291	539,277			12,060	
New York	66	990,701	356,411	439,367	35,081	745		17,805	99,158
New Hampshire	8	431,138	336,142	76,418	1,200				
Pennsylvania	13	425,684	9,929	148,171	12,366		50,641	2,015	71,443
Michigan	12	331,570	82,980	86,247	62,602			93	27
Virginia	6	317,058	8,898	56,469	26,165		162,751		
Washington	8	305,787	40,796		134,077	6,000			
Minnesota	7	288,300	218,507					21,150	
Louisiana	5	258,439					258,439		
Massachusetts	3	54,510	37,703	11,287				5,463	57
Vermont	6	48,554	41,972	1,549				100	
California and Oregon	7	232,089	36,759		160,428			186	
All other States [1]	16	558,387	65,866		63,155		212,985	21,112	
United States	224	6,766,007	2,415,870	1,013,155	1,064,661	10,702	684,816	212,178	210,133

State	Balsam fir		Jack pine	Yellow poplar	Tamarack or larch	White fir	Gum	All other	Slabs and other mill waste
	Domestic	Imported							
	Cords	*Cords*	*Cords*	*Cords*	*Cords*	*Cords*	*Cords*	*Cords*	*Cords*
Maine	71,571	27,106						25,681	6,345
Wisconsin	96,566		90,797		58,628				15,633
New York	28,264	9,755						4,115	
New Hampshire	5,750								11,508
Pennsylvania		2,000		21,878			16,660	36,293	51,288
Michigan	47,530	3,639	16,158		19,972				12,327
Virginia				49,201				3,538	9,738
Washington						40,865		29,366	54,743
Minnesota			30,544		16,095			2,094	
Louisiana									
Massachusetts									
Vermont	4,933								
California and Oregon						35,616			
All other States [1]				63,668			33,141	82,463	15,907
United States	254,614	42,500	137,491	134,747	91,695	76,421	49,801	183,553	180,667

Bureau of the Census in cooperation with the Forest Service.

[1] Delaware, 1 establishment; District of Columbia, 1; Georgia, 1; Maryland, 2; Mississippi, 1; North Carolina, 2; Ohio, 1; South Carolina, 1; Tennessee, 2; Texas, 1; and West Virginia, 3.

TABLE 554.—*Woodland on farms, 1925, and firewood produced on farms, and expenditures, by farms, for lumber, posts, firewood, etc., 1924*

State	Woodland on farms, 1925			Firewood cut on farms, 1924		Farm expenditures for lumber, posts, firewood, etc., 1924		
	Woodland pastured	Woodland not pastured	Total woodland	Quantity	Farms reporting	Total	Farms reporting	Average per farm reporting
	Acres	*Acres*	*Acres*	*Cords*	*Number*	*Dollars*	*Number*	*Dollars*
Alabama	1, 928, 087	3, 855, 958	5, 784, 045	1, 442, 538	140, 768	1, 302, 134	14, 160	89. 13
Arizona	389, 389	47, 397	436, 786	21, 551	1, 483	435, 448	2, 172	200. 48
Arkansas	1, 675, 575	3, 717, 325	5, 392, 900	1, 702, 141	127, 120	1, 798, 166	20, 174	89. 13
California	4, 227, 934	437, 489	4, 665, 423	321, 093	20, 343	8, 337, 452	34, 172	243. 98
Colorado	1, 114, 461	238, 506	1, 352, 967	66, 624	4, 615	2, 306, 228	16, 704	138. 06
Connecticut	356, 652	373, 271	729, 923	248, 513	15, 058	1, 584, 310	7, 101	223. 11
Delaware	10, 386	188, 180	198, 566	59, 661	5, 128	257, 378	2, 566	100. 30
District of Columbia	96	180	276	73	4	9, 151	21	435. 76
Florida	793, 782	1, 498, 301	2, 292, 083	241, 627	25, 078	1, 143, 971	5, 487	208. 49
Georgia	2, 324, 250	4, 721, 563	7, 045, 813	1, 807, 943	151, 738	1, 502, 692	15, 083	99. 63
Idaho	646, 139	97, 422	743, 561	96, 174	5, 672	1, 366, 534	12, 366	110. 51
Illinois	1, 896, 966	738, 642	2, 635, 608	672, 300	52, 051	8, 377, 203	54, 870	152. 67
Indiana	1, 878, 949	838, 013	2, 716, 962	1, 059, 305	64, 846	3, 893, 549	32, 255	120. 71
Iowa	1, 970, 145	242, 795	2, 212, 940	770, 934	62, 059	11, 881, 542	74, 119	160. 30
Kansas	651, 057	343, 339	994, 396	343, 847	32, 890	7, 117, 391	49, 360	114. 19
Kentucky	1, 207, 516	3, 627, 902	4, 835, 418	1, 523, 275	105, 666	2, 105, 213	19, 992	105. 30
Louisiana	674, 327	1, 731, 892	2, 406, 219	572, 167	45, 951	1, 640, 452	13, 006	126. 13
Maine	980, 645	1, 508, 392	2, 489, 037	609, 518	34, 910	986, 028	10, 587	93. 14
Maryland	187, 183	945, 760	1, 132, 943	339, 282	27, 901	1, 298, 160	10, 703	121. 29
Massachusetts	482, 453	637, 469	1, 119, 922	323, 923	17, 673	1, 693, 621	8, 386	201. 96
Michigan	2, 407, 150	894, 631	3, 301, 781	1, 397, 212	72, 990	6, 134, 987	48, 719	125. 93
Minnesota	3, 556, 303	1, 193, 508	4, 749, 811	1, 154, 410	87, 340	9, 526, 222	63, 635	149. 70
Mississippi	2, 027, 611	3, 419, 486	5, 447, 097	1, 247, 097	124, 455	1, 678, 639	16, 768	100. 11
Missouri	4, 780, 176	2, 625, 667	7, 405, 843	1, 955, 962	128, 763	5, 201, 472	47, 755	108. 92
Montana	1, 311, 615	234, 158	1, 545, 773	84, 354	5, 196	1, 397, 880	11, 943	117. 05
Nebraska	657, 020	226, 248	883, 268	178, 322	20, 773	8, 507, 590	53, 594	158. 74
Nevada	63, 069	6, 553	69, 622	2, 877	143	269, 525	1, 457	184. 99
New Hampshire	779, 501	536, 743	1, 316, 244	279, 102	14, 714	535, 728	4, 563	117. 41
New Jersey	43, 610	253, 542	297, 152	94, 572	10, 566	2, 282, 876	10, 643	214. 50
New Mexico	2, 144, 857	170, 138	2, 314, 995	47, 646	3, 665	571, 748	6, 012	95. 10
New York	2, 025, 249	1, 780, 380	3, 805, 629	1, 904, 322	105, 818	6, 988, 009	49, 420	141. 37
North Carolina	1, 386, 759	7, 069, 724	8, 456, 483	2, 534, 991	184, 995	2, 166, 937	18, 522	117. 00
North Dakota	337, 240	173, 522	510, 762	52, 431	3, 660	4, 956, 084	35, 165	140. 94
Ohio	1, 854, 403	973, 090	2, 827, 493	1, 146, 830	68, 136	4, 660, 391	40, 900	113. 95
Oklahoma	2, 971, 895	458, 078	3, 429, 973	757, 837	59, 930	3, 884, 400	31, 564	123. 08
Oregon	2, 144, 963	519, 674	2, 664, 637	498, 856	23, 209	2, 754, 529	23, 329	118. 07
Pennsylvania	1, 391, 193	2, 138, 996	3, 530, 189	858, 892	72, 588	4, 848, 090	38, 138	127. 12
Rhode Island	50, 093	94, 831	144, 924	38, 329	2, 036	299, 109	1, 451	206. 14
South Carolina	1, 008, 359	2, 562, 006	3, 570, 365	1, 152, 059	96, 407	1, 478, 820	11, 753	125. 82
South Dakota	287, 661	112, 393	400, 054	42, 812	5, 280	6, 354, 497	34, 199	185. 81
Tennessee	1, 364, 386	4, 198, 111	5, 562, 497	2, 305, 359	155, 318	1, 703, 434	20, 611	82. 65
Texas	11, 230, 062	1, 460, 762	12, 690, 824	1, 474, 608	132, 638	11, 995, 193	73, 917	162. 28
Utah	93, 357	63, 871	161, 228	4, 704	572	743, 012	6, 613	112. 36
Vermont	1, 031, 310	517, 724	1, 549, 034	406, 607	20, 118	495, 511	5, 078	97. 58
Virginia	1, 331, 719	5, 523, 513	6, 855, 232	1, 864, 509	134, 970	3, 025, 948	27, 660	109. 40
Washington	1, 317, 170	538, 413	1, 855, 583	411, 902	28, 935	4, 209, 235	31, 992	131. 57
West Virginia	905, 058	2, 263, 565	3, 168, 623	520, 685	35, 144	964, 965	8, 539	113. 01
Wisconsin	4, 431, 416	1, 216, 711	5, 648, 127	1, 858, 066	115, 645	9, 442, 638	71, 643	131. 80
Wyoming	370, 749	74, 412	445, 161	22, 688	1, 869	661, 207	4, 542	145. 58
Total	76, 703, 946	67, 090, 246	143, 794, 192	36, 520, 630	2, 656, 857	166, 775, 370	1, 203, 868	138. 53

Bureau of the Census, and Forest Service.

TABLE 555.—*Rubber: International trade, average 1909–1913, annual 1923–1926*

Country	Average 1909–1913		1923		1924		1925		1926, preliminary	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
PRINCIPAL EXPORTING COUNTRIES										
Angola		5,620		198						
Belgian Congo		7,755		981		1,252		1,696		[1] 2,260
Bolivia		8,395		6,568		6,737		7,480		6,845
Brazil		84,938	[1] 45	39,666	48	46,666	49	50,486		51,264
British India		[2] 1,504	13	14,371	129	17,241	104	22,583	18	22,118
British Malaya	[1] 53,472	[1] 85,435	157,481	564,765	241,928	584,123	350,419	705,438	334,052	869,096
British North Borneo[1]		331		9,495		10,350		12,152		13,656
Ceylon	[2] 1,299	10,953	5,644	83,851	6,863	83,040	8,809	102,206	10,944	131,876
Dutch East Indies	[3] 1	7,679		316,084		400,983		533,752		[1] 538,807
Ecuador		1,040		1,297		732		2,949		2,400
French Congo	(4)	3,797		[1] 2,150		[1] 2,950		[1] 2,434		[1] 2,000
French Guinea	[1] 241	3,937	[1] 31	2,631	[1] 29	[1] 2,289	[1] 49	[1] 2,985	[1] 81	[1] 2,773
French Indo-China	1	398	[1] 4	[1] 12,558	[1] 7	[1] 14,982	[1] 13	[1] 17,653	[1] 25	[1] 19,350
Gold Coast		2,393		[1] 313		[1] 272		[1] 1,098		0
Kamerun		6,409		[1] 1,677		[1] 2,134		[1] 1,832		[1] 2,286
Mexico		[1] 13,462		[1] 3,100		[1] 3,502	[5] 128	[1] 9,971	[5] 104	[5] 6,693
Nigeria		3,054		478		1,170		2,128		[1] 3,571
Peru		5,030		4		198		16		
Switzerland	391	725	552	260	646	359	1,036	1,347	914	1,750
PRINCIPAL IMPORTING COUNTRIES										
Austria	[6] 6,696	[6] 1,619	5,396	969	5,410	646	5,401	913	5,008	1,019
Belgium	25,891	20,749	7,411	2,518	7,981	1,946	8,464	1,950	8,212	2,617
Canada	3,945		29,696	(4)	32,300		44,548		45,367	
Czechoslovakia			[1] 603	[1] 27	4,075	[1] 13	3,693	201	4,189	262
Denmark	250		794	[1] 10	1,062	[1] 3	1,082	[1] 1	1,291	4
France	32,704	21,615	71,840	10,482	79,858	11,659	100,816	16,928	107,376	20,222
Germany	42,004	9,844	43,538	2,056	52,592	1,684	79,579	3,571	55,201	4,185
Hungary			985	3	[1] 1,624	[1] 35	997	134	1,327	68
Italy	5,381	225	19,244	226	19,878	248	26,381	817	22,570	596
Japan	1,917		38,793		44,281		28,793		40,923	
Netherlands	10,822	7,172	17,791	16,016	12,864	14,672	6,909	4,949	11,925	5,944

[1] International Yearbook of Agricultural Statistics.
[2] Three-year average.
[3] One year only.
[4] Less than 500 pounds.
[5] Six months.
[6] Average for Austria-Hungary.

TABLE 555.—*Rubber: International trade, average 1909–1913, annual 1923–1926*—Continued

Country	Year ended Dec. 31									
	Average 1909–1913		1923		1924		1925		1926, preliminary	
	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports
PRINCIPAL IMPORTING COUNTRIES—continued	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Russia	19,131		[1] 5,381		[1] 4,548		[1] 14,192		[1] 16,014	
Spain	1,067		4,870		8,137		7,487		8,804	
Sweden	1,695	1	3,076	141	3,917	123	3,705	109	4,701	167
United Kingdom	43,141		28,449		[1] 25,872		11,043		190,251	
United States	100,180		692,483		734,845		888,478		925,878	
Total 35 countries	350,229	314,080	1,134,120	1,092,895	1,237,150	1,210,009	1,592,175	1,507,779	1,795,175	1,711,829

Bureau of Agricultural Economics. Official sources except where otherwise noted.
Figures for rubber include "india rubber," so called, caoutchouc, caucho, jebe (Peru), hule (Mexico), borracha, massaranduba, mangabeira, manicoba, sorva, and seringa (Brazil), gemelastiek (Dutch East Indies), caura, ser nambi (Venezuela).

[1] International Yearbook of Agricultural Statistics.

[2] Reexports in excess of imports.

TABLE 556.—*Temperature: Normal*[1] *and 1927, by months, at selected points in the United States*

Station	January		February		March		April		May		June	
	Normal	1927	Normal	1927	Normal	1927	Normal	1927	Normal	1927	Normal	1927
	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.
Greenville, Me.	12.8	15.8	12.4	15.0	23.5	29.0	36.4	38.0	49.5	46.8	58.9	56.2
Boston, Mass.	27.9	30.6	28.8	32.6	35.6	41.6	46.4	48.3	57.1	55.2	66.5	65.0
Buffalo, N. Y.	24.6	23.4	24.3	29.4	31.1	36.2	42.8	42.9	54.6	53.0	64.4	59.6
Canton, N. Y.	16.3	15.8	18.0	19.3	27.7	32.8	42.5	42.2	56.2	52.3	65.1	60.7
Trenton, N. J.	30.5	30.1	30.7	37.6	39.1	43.4	49.8	48.0	61.1	59.0	69.5	66.4
Pittsburgh, Pa.	30.7	30.1	32.3	38.1	39.6	41.8	51.2	49.9	62.4	60.1	70.7	64.6
Scranton, Pa.	26.6	25.5	27.3	33.2	35.7	40.0	48.1	45.9	59.4	56.2	67.8	63.2
Cincinnati, Ohio	30.3	31.5	32.8	40.8	40.9	46.1	52.4	53.6	63.1	63.0	71.2	67.2
Cleveland, Ohio	26.5	26.6	27.4	33.7	34.6	40.3	46.2	47.2	57.9	57.2	67.1	63.2
Evansville, Ind.	33.5	33.9	36.3	44.5	45.9	48.6	56.7	58.6	66.7	65.4	75.1	71.5
Indianapolis, Ind.	28.4	28.0	31.1	39.2	40.0	44.9	52.1	51.8	62.9	61.2	71.6	67.0
Chicago, Ill.	23.7	24.8	26.3	35.0	35.3	42.0	46.9	47.8	57.5	56.8	67.3	64.8
Peoria, Ill.	23.1	23.4	25.9	36.1	37.0	43.2	50.9	50.8	61.7	60.0	70.9	67.2
Grand Rapids, Mich.	24.5	23.3	23.7	31.1	33.4	39.8	47.0	46.4	58.0	55.9	67.8	64.2
Marquette, Mich.	16.3	15.6	16.3	21.2	24.8	32.8	37.8	39.9	49.0	44.6	58.9	57.7
Madison, Wis.	16.7	16.6	19.1	28.1	30.6	38.3	45.4	45.0	57.6	54.3	67.2	63.6
Duluth, Minn.	7.9	7.6	11.4	15.6	23.7	30.6	37.0	38.6	47.3	41.2	57.2	56.6
St. Paul, Minn.	12.6	13.0	15.8	22.8	29.1	35.4	45.6	46.1	57.9	53.5	67.1	63.8
Des Moines, Iowa	20.1	25.1	23.7	32.6	35.9	41.1	50.1	50.4	61.3	60.2	70.6	67.8
Dubuque, Iowa	19.1	19.7	22.2	31.4	34.0	40.1	48.6	48.4	60.3	56.8	69.4	66.0
St. Louis, Mo.	31.1	31.6	34.8	43.2	44.1	47.9	56.1	57.0	67.0	64.5	75.0	71.2
Springfield, Mo.	33.5	34.4	35.2	43.8	45.2	46.8	56.0	59.7	64.5	65.6	72.5	70.2
Bismarck, N. Dak.	7.8	14.0	10.3	17.6	24.2	31.9	42.1	43.6	54.5	49.1	63.7	62.3
Devils Lake, N. Dak.	0.3	6.5	4.5	10.1	18.5	29.0	38.2	40.0	52.7	47.2	62.6	61.6
Pierre, S. Dak.	16.0	20.7	18.6	27.2	31.5	37.0	46.8	46.2	58.0	54.8	68.5	66.4
North Platte, Nebr.	22.9	26.4	26.6	32.6	36.6	35.9	48.6	50.4	58.7	61.4	67.5	66.4
Omaha, Nebr.	21.9	26.4	25.5	32.8	37.0	41.0	51.2	52.4	62.4	61.1	71.6	70.4
Concordia, Kans.	26.4	30.0	29.8	36.4	41.0	42.2	53.5	54.6	63.2	63.1	73.0	70.4
Dodge City, Kans.	29.0	33.2	33.2	38.6	42.8	41.8	53.6	56.6	63.5	66.0	72.5	71.0
Iola, Kans.	20.8	32.4	33.2	41.0	44.5	45.8	56.2	60.0	65.2	65.6	74.1	71.4
Washington, D. C.	33.4	34.0	35.3	42.1	42.6	47.6	53.3	51.9	63.7	64.0	72.2	68.6
Lynchburg, Va.	37.5	38.4	40.3	47.0	47.3	51.2	57.3	55.4	67.3	66.2	74.6	70.4
Norfolk, Va.	40.6	40.2	42.7	48.3	48.2	51.6	56.8	54.8	66.2	66.7	74.4	70.1
Parkersburg, W. Va.	32.5	32.8	34.2	41.2	42.8	47.0	53.4	53.2	63.8	63.7	71.4	66.9
Charlotte, N. C.	41.2	42.8	43.9	53.4	50.4	53.6	59.8	61.4	68.9	70.6	75.5	73.3
Charleston, S. C.	49.9	49.6	52.4	61.2	57.4	58.9	64.5	66.3	72.7	74.6	78.9	78.8
Atlanta, Ga.	42.6	44.6	45.3	55.0	52.0	54.8	61.0	64.2	69.9	71.1	76.0	74.2
Thomasville, Ga.	51.0	53.8	55.0	63.0	60.2	61.8	66.7	70.6	74.0	76.4	79.5	80.8
Jacksonville, Fla.	55.4	55.6	58.0	64.9	62.6	64.2	68.7	71.0	75.0	76.7	79.9	81.2
Miami, Fla.	66.5	65.8	67.1	72.5	70.2	70.2	72.8	74.4	76.4	78.5	80.0	82.3
Memphis, Tenn.	40.9	42.4	44.3	51.8	52.3	53.4	61.8	65.2	70.6	71.8	77.6	75.9
Nashville, Tenn.	38.6	40.5	41.6	50.7	49.2	51.4	59.0	62.6	68.2	69.6	75.6	73.4
Birmingham, Ala.	45.1	48.0	48.0	57.2	55.4	55.6	63.3	66.8	71.1	72.1	77.9	76.8
Mobile, Ala.	51.5	54.2	54.7	63.0	59.7	60.8	66.3	71.0	74.4	75.2	80.3	80.6
New Orleans, La.	54.2	58.8	57.3	65.4	62.8	63.5	68.8	73.0	75.4	77.6	80.6	82.0
Shreveport, La.	47.0	51.6	50.9	58.6	58.3	59.0	65.8	70.2	73.6	75.8	80.7	79.0
Amarillo, Tex.	35.3	41.1	38.1	44.6	46.9	48.0	55.8	60.6	64.1	71.0	72.8	73.8
Brownsville, Tex.	59.8	63.7	62.6	68.0	68.2	68.3	73.7	76.6	78.6	81.6	82.4	82.2
El Paso, Tex.	45.0	49.8	49.0	54.1	55.8	55.8	63.4	64.7	71.5	75.0	79.6	80.8
Fort Worth, Tex.	45.4	46.0	48.3	51.6	57.7	56.6	65.0	68.2	72.3	77.6	79.9	80.1
Galveston, Tex.	53.8	58.8	56.3	62.8	62.4	62.8	68.7	72.3	74.8	77.9	80.7	80.8
San Antonio, Tex.	52.3	55.8	55.4	61.6	62.8	63.2	69.1	73.2	75.1	80.4	81.0	80.0
Oklahoma City, Okla.	36.4	38.1	39.6	46.6	50.0	50.0	59.8	63.6	67.7	71.1	76.0	75.8
Little Rock, Ark.	41.4	43.0	44.9	52.2	53.0	54.0	62.1	66.2	70.3	71.8	77.4	76.2
Havre, Mont.	12.9	13.4	13.6	15.1	27.1	32.6	43.7	42.2	53.4	48.6	62.0	61.8
Kalispell, Mont.	20.4	20.6	23.3	26.7	32.9	33.8	43.6	40.8	51.4	48.0	57.7	58.8
Cheyenne, Wyo.	25.5	29.8	27.3	29.0	33.1	30.8	40.9	40.4	50.3	51.0	60.4	58.9
Sheridan, Wyo.	18.9	18.2	22.4	25.6	32.7	34.3	43.4	40.8	50.7	49.6	61.1	60.0
Pueblo, Colo.	29.9	35.4	32.9	38.5	41.6	38.8	50.1	52.4	59.2	64.0	69.0	68.8
Santa Fe, N. Mex.	28.8	36.3	33.1	37.6	39.7	39.6	46.7	48.8	55.7	58.6	64.8	64.8
Phoenix, Ariz.	51.2	56.2	55.1	58.8	60.7	59.1	67.0	67.3	75.0	76.0	84.5	83.7
Modena, Utah	26.7	30.2	31.0	35.7	38.2	38.8	46.0	45.8	53.5	53.6	63.3	65.0
Salt Lake City, Utah	29.2	32.6	33.8	38.0	41.7	41.0	49.6	48.8	57.4	55.6	67.4	68.8
Winnemucca, Nev.	28.6	32.8	33.5	35.0	40.0	39.4	46.7	45.2	53.9	52.4	62.8	64.6
Boise, Idaho	29.8	31.8	34.8	39.7	42.7	42.0	50.4	48.4	57.1	54.4	65.3	66.2
Seattle, Wash.	39.5	40.6	41.1	43.9	44.9	43.8	49.4	48.7	54.5	52.4	59.0	61.5
Walla Walla, Wash.	32.7	30.4	37.1	41.6	46.1	45.4	53.1	51.0	59.6	56.9	66.5	69.2
Portland, Oreg.	39.4	39.0	42.1	45.6	46.9	46.9	51.8	52.0	56.9	55.4	62.4	64.4
Roseburg, Oreg.	41.2	42.8	43.4	45.2	47.1	46.0	51.0	51.4	56.0	56.0	62.5	65.2
Eureka, Calif.	46.9	49.8	47.2	49.8	48.3	47.4	49.9	48.8	52.0	51.2	54.3	55.4
Fresno, Calif.	46.2	47.8	51.1	53.2	55.0	54.4	60.2	60.8	67.1	67.1	75.8	75.2
Los Angeles, Calif.	54.6	57.2	55.5	56.6	57.5	57.4	59.4	59.5	62.2	63.8	66.4	65.0
Sacramento, Calif.	45.8	47.4	50.1	51.8	54.3	53.2	58.1	58.0	63.3	63.8	69.4	70.6
San Diego, Calif.	54.3	55.4	55.1	56.4	56.7	56.6	58.5	58.2	60.8	61.4	63.9	63.8
San Francisco, Calif.	49.9	51.3	52.2	54.0	54.2	54.2	55.0	55.6	56.8	58.2	58.5	59.8

[1] Normals are based on records of 30 or more years of observations.

TABLE 556.—*Temperature: Normal and 1927, by months, at selected points in the United States*—Continued

Station	July		August		September		October		November		December		Annual	
	Normal	1927	Normal	1927	Normal	1927	Normal	1927	Normal	1927	Normal	1927	Normal	1927
	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.	° F.
Greenville, Me	65.4	65.4	62.5	60.8	55.0	56.0	45.6	47.1	30.7	35.6	18.0	22.2	39.2	40.7
Boston, Mass	71.7	72.2	69.9	67.4	63.2	65.0	53.6	57.9	42.0	49.6	32.5	36.0	49.6	51.8
Buffalo, N. Y	69.8	68.2	68.6	64.4	62.4	64.5	51.9	54.9	39.4	42.8	29.8	30.4	47.0	47.5
Canton, N. Y	68.9	67.4	66.6	62.7	59.3	59.4	47.2	49.2	33.9	38.2	22.7	21.4	44.0	43.7
Trenton, N. J	74.5	74.2	73.0	68.0	66.9	66.8	55.6	57.8	44.4	49.3	34.4	36.8	52.5	53.1
Pittsburgh, Pa	74.6	73.0	72.9	67.0	66.4	68.1	55.7	57.3	43.2	47.2	34.2	33.7	52.8	52.8
Scranton, Pa	71.7	71.2	69.8	64.4	62.9	63.4	51.9	55.1	40.5	44.6	30.7	32.2	49.4	49.6
Cincinnati, Ohio	75.1	75.5	73.6	68.3	67.1	71.4	55.7	59.6	42.5	48.8	33.4	33.4	53.2	54.9
Cleveland, Ohio	71.4	71.6	70.0	65.4	63.9	67.6	53.6	57.6	40.9	46.6	31.2	32.2	49.2	50.8
Evansville, Ind	78.9	77.8	77.4	72.2	70.7	74.7	59.4	62.4	46.6	50.1	37.1	35.6	57.0	57.9
Indianapolis, Ind	75.7	74.2	73.7	68.2	66.9	71.4	55.7	60.0	42.3	46.6	32.2	30.8	52.7	53.6
Chicago, Ill	72.5	71.7	71.6	66.7	65.2	69.0	54.0	58.0	40.1	43.2	28.8	26.9	49.1	50.6
Peoria, Ill	75.4	73.7	72.5	68.5	64.3	70.0	52.0	58.0	37.5	31.4	28.1	25.9	49.9	50.7
Grand Rapids, Mich	72.3	71.2	69.7	65.7	62.7	67.2	51.2	55.5	38.4	41.8	28.5	28.0	48.1	49.2
Marquette, Mich	64.9	63.0	63.8	60.6	57.5	60.8	46.7	49.2	33.3	31.9	22.6	18.4	41.0	41.3
Madison, Wis	72.1	70.4	69.8	66.4	62.4	64.8	50.3	53.6	35.2	37.1	22.8	18.6	45.8	46.1
Duluth, Minn	63.9	62.2	62.6	60.2	55.1	57.4	44.1	46.0	30.0	24.2	15.9	5.5	38.0	37.4
St. Paul, Minn	72.1	68.3	69.4	65.8	61.3	62.4	48.6	51.0	32.5	29.2	19.0	8.1	41.2	43.3
Des Moines, Iowa	75.4	75.3	73.1	69.8	65.6	68.9	53.4	57.6	38.4	39.2	26.0	21.2	49.5	50.8
Dubuque, Iowa	74.1	72.4	71.7	67.2	64.0	66.8	51.9	55.0	37.0	39.5	24.7	20.3	48.1	48.6
St. Louis, Mo	78.8	77.6	77.5	72.2	70.5	75.3	58.8	62.8	45.4	48.0	31.9	32.4	56.2	57.0
Springfield, Mo	76.8	74.8	75.7	70.5	68.9	71.3	58.2	62.2	45.7	47.9	36.2	33.1	55.7	56.7
Bismarck, N. Dak	69.8	67.2	67.3	66.4	58.1	58.6	44.9	49.4	28.5	22.6	14.7	−2.4	40.5	40.0
Devils Lake, N. Dak	68.1	64.6	65.1	62.8	55.6	56.4	40.5	45.8	22.6	17.6	8.0	−1.4	36.1	36.7
Pierre, S. Dak	75.3	72.4	72.8	70.4	63.8	64.2	49.8	51.3	33.6	29.2	21.8	3.8	46.4	45.6
North Platte, Nebr	72.9	73.8	70.8	68.7	62.1	65.2	49.7	56.1	36.6	37.9	26.7	19.1	48.3	49.5
Omaha, Nebr	76.7	76.8	74.1	70.4	66.8	69.2	51.3	59.1	38.5	39.2	26.4	19.6	50.6	51.5
Concordia, Kans	78.0	76.5	76.5	70.4	68.3	66.0	55.9	60.2	41.4	41.9	[illegible]	23.8	53.1	53.3
Dodge City, Kans	78.4	77.3	77.7	71.8	69.4	69.0	56.1	60.6	42.6	44.6	32.6	27.5	54.3	54.8
Iola, Kans	78.2	76.9	77.1	71.8	69.8	69.9	57.8	61.9	44.1	46.1	33.9	29.5	55.3	56.0
Washington, D. C	76.8	76.4	75.0	70.0	68.1	70.1	[illegible]	60.4	45.2	51.0	36.6	39.0	55.0	56.3
Lynchburg, Va	77.5	75.6	75.6	70.8	69.0	71.4	58.5	60.4	47.2	51.6	39.5	40.1	57.6	58.2
Norfolk, Va	78.7	76.8	77.4	73.7	71.6	73.2	62.5	61.6	51.4	55.6	43.1	44.5	59.5	60.0
Parkersburg, W. Va	75.4	74.4	73.9	68.7	67.3	70.0	56.1	60.0	43.8	49.5	35.2	36.0	54.2	55.3
Charlotte, N. C	78.4	78.5	77.1	74.8	71.5	74.5	61.7	64.0	50.6	55.0	43.0	43.1	60.3	62.1
Charleston, S. C	81.4	80.6	81.0	79.5	76.6	78.1	67.8	69.6	58.1	61.6	51.7	50.8	66.0	67.5
Atlanta, Ga	78.1	77.6	77.0	75.9	72.4	75.1	63.0	66.2	52.1	55.7	44.7	44.2	61.2	63.2
Thomasville, Ga	81.8	81.6	81.0	80.6	76.8	78.6	68.2	71.5	58.5	61.2	52.5	52.4	67.1	69.6
Jacksonville, Fla	82.1	81.2	81.7	81.0	78.3	78.5	71.1	71.8	62.2	65.7	56.3	55.6	68.5	70.6
Miami, Fla	81.0	82.1	81.4	82.8	80.1	80.0	77.0	77.0	71.8	73.0	68.0	67.1	74.1	75.5
Memphis, Tenn	80.7	79.9	79.4	75.6	73.6	77.0	63.3	66.4	51.7	56.2	43.6	41.2	61.6	63.1
Nashville, Tenn	79.1	78.4	77.8	74.2	71.8	74.8	61.0	63.6	49.0	54.6	41.0	40.2	59.3	61.1
Birmingham, Ala	80.2	80.1	79.2	77.7	74.8	78.0	64.8	68.1	53.0	59.2	46.1	44.1	63.3	65.5
Mobile, Ala	81.4	82.6	81.0	81.1	78.1	79.4	69.3	70.6	58.6	64.4	52.2	51.4	67.5	69.5
New Orleans, La	82.4	83.4	82.2	82.5	79.2	80.9	71.0	74.0	61.6	67.3	55.8	54.2	69.5	71.9
Shreveport, La	83.2	82.0	82.0	82.6	76.9	79.1	66.6	70.4	56.0	63.3	49.1	46.2	65.8	68.3
Amarillo, Tex	76.8	78.2	75.7	75.4	69.3	68.2	57.7	63.3	45.5	52.6	37.0	34.6	56.5	59.3
Brownsville, Tex	83.6	83.6	83.9	84.4	80.6	82.6	71.9	76.1	67.2	73.8	61.2	56.8	73.1	71.9
El Paso, Tex	81.1	83.0	79.2	79.8	73.9	75.6	63.5	66.0	52.7	60.6	44.9	42.5	63.3	65.8
Fort Worth, Tex	83.6	83.8	83.0	84.8	76.9	78.0	66.7	70.6	55.5	63.1	47.5	41.4	65.2	67.1
Galveston, Tex	83.4	83.8	83.0	84.8	80.1	81.3	72.7	75.2	63.3	71.3	56.4	55.8	69.6	72.0
San Antonio, Tex	83.8	84.8	83.5	86.0	79.0	80.4	70.5	73.3	60.3	65.8	53.7	50.1	68.9	71.6
Oklahoma City, Okla	80.6	80.0	79.7	76.8	72.8	74.8	61.5	66.2	48.8	53.3	39.3	35.0	59.4	60.8
Little Rock, Ark	80.9	80.6	79.8	76.6	74.1	76.6	63.6	67.2	52.1	56.4	44.2	42.3	62.0	63.6
Havre, Mont	68.3	68.6	65.4	65.6	56.4	55.1	44.5	49.1	31.2	20.8	20.1	1.2	41.6	39.5
Kalispell, Mont	64.1	65.2	62.8	62.8	53.5	52.9	43.5	45.8	32.4	31.8	21.9	14.7	42.5	42.0
Cheyenne, Wyo	66.7	64.9	65.6	61.8	57.0	56.2	44.8	48.9	31.8	30.1	28.6	21.4	41.6	44.4
Sheridan, Wyo	67.3	66.8	65.4	62.4	56.3	55.4	43.7	48.4	32.8	32.8	22.1	11.5	43.1	42.1
Pueblo, Colo	74.2	74.0	72.7	69.3	64.6	63.7	52.0	55.2	39.4	46.0	31.5	27.0	51.1	52.6
Santa Fe, N. Mex	69.0	70.4	67.4	66.8	60.9	60.6	50.4	51.3	38.9	43.1	30.7	27.0	48.8	50.4
Phoenix, Ariz	89.8	91.3	88.5	87.8	82.7	82.6	70.6	71.5	59.7	64.2	52.0	50.9	69.5	70.7
Modena, Utah	70.6	71.9	69.2	67.6	60.0	59.6	48.0	50.9	36.4	41.2	28.1	21.8	47.6	48.5
Salt Lake City, Utah	75.7	78.2	74.5	73.2	64.4	63.2	52.5	55.4	41.1	46.8	31.9	27.9	51.6	52.5
Winnemucca, Nev	70.6	72.4	69.3	67.2	59.2	56.0	48.3	49.8	38.1	43.2	30.0	24.4	48.4	48.5
Boise, Idaho	72.9	74.8	71.8	71.6	61.9	59.6	51.1	51.1	41.0	45.8	32.1	28.0	50.9	51.4
Seattle, Wash	63.1	65.2	63.1	65.0	58.1	58.7	51.4	53.2	45.6	46.5	41.7	38.0	51.0	51.5
Walla Walla, Wash	74.0	76.6	72.7	74.6	63.8	60.7	53.5	55.5	42.8	47.1	35.5	30.2	53.1	53.3
Portland, Oreg	66.7	58.6	66.7	69.2	61.7	61.9	54.2	55.0	46.8	49.8	41.2	37.8	54.1	53.0
Roseburg, Oreg	67.4	68.2	68.0	69.1	62.9	60.5	53.9	55.4	45.9	50.6	41.8	39.0	53.4	54.1
Eureka, Calif	55.5	55.6	56.0	56.6	55.9	58.1	53.6	53.8	51.1	53.3	48.2	45.1	51.6	52.1
Fresno, Calif	82.1	82.8	80.7	79.0	73.4	70.0	64.0	67.0	54.2	54.5	46.2	47.1	63.0	63.2
Los Angeles, Calif	70.2	72.1	71.1	70.4	69.0	68.4	65.3	67.4	60.9	65.8	56.6	56.2	62.4	63.3
Sacramento, Calif	73.2	74.5	72.9	71.6	69.3	68.2	62.9	65.4	53.6	54.4	46.2	45.9	59.9	60.4
San Diego, Calif	67.2	69.2	68.7	69.0	67.1	66.4	63.7	64.6	59.7	63.3	55.0	56.0	61.0	61.8
San Francisco, Calif	58.5	58.6	59.1	59.8	60.9	62.4	60.5	62.5	56.3	58.1	51.3	51.8	56.1	57.2

Weather Bureau.

TABLE 557.—*Precipitation: Normal*[1] *and 1927, by months, at selected points in the United States*

Station	January		February		March		April		May		June	
	Normal	1927	Normal	1927	Normal	1927	Normal	1927	Normal	1927	Normal	1927
	Ins.	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*
Greenville, Me	2.83	2.79	2.97	2.62	3.16	0.97	2.93	0.88	3.31	6.70	3.81	1.57
Boston, Mass	3.82	2.67	3.44	3.28	4.08	1.19	3.55	1.36	3.51	3.50	3.03	2.43
Buffalo, N. Y	3.22	1.75	2.85	2.87	2.63	1.76	2.53	1.97	2.97	3.77	2.84	2.04
Canton, N. Y	3.16	1.56	2.57	2.21	2.84	1.55	2.26	.94	2.85	4.01	3.43	1.54
Trenton, N. J	3.17	2.02	3.19	2.59	4.04	.83	3.29	2.91	3.52	2.78	3.49	3.30
Pittsburgh, Pa	2.87	3.52	2.66	3.97	3.01	3.20	2.90	3.15	3.30	3.74	3.89	2.77
Scranton, Pa	2.80	2.14	2.72	2.55	3.12	1.99	2.65	2.35	3.44	4.47	3.57	4.07
Cincinnati, Ohio	3.36	4.44	3.21	2.20	3.64	3.65	2.95	4.77	3.52	4.67	3.98	4.22
Cleveland, Ohio	2.45	1.51	2.61	2.83	2.79	3.62	2.31	1.75	3.22	3.44	3.68	1.63
Evansville, Ind	3.69	5.95	3.06	.90	4.60	8.15	3.46	6.47	3.43	7.80	4.17	3.04
Indianapolis, Ind	2.81	3.15	3.08	2.36	4.01	6.32	3.47	5.16	3.94	5.62	4.31	1.24
Chicago, Ill	2.00	1.15	2.16	.75	2.55	2.69	2.88	6.01	3.37	4.40	3.66	2.55
Peoria, Ill	2.20	1.76	2.69	2.85	2.96	4.55	3.28	4.87	4.26	9.22	4.30	5.71
Grand Rapids, Mich	2.78	1.05	1.91	1.34	2.52	2.20	2.45	3.05	3.34	3.81	2.52	1.45
Marquette, Mich	2.04	1.34	1.72	1.73	2.08	2.17	1.99	1.25	3.32	5.45	3.51	1.81
Madison, Wis	1.56	1.05	1.47	.62	2.21	2.23	2.38	3.39	3.62	6.85	4.10	2.17
Duluth, Minn	.98	.72	.99	1.52	1.55	1.46	2.14	3.07	3.47	3.27	4.53	4.06
St. Paul, Minn	.90	.68	.84	.28	1.60	2.07	2.33	2.16	3.62	2.59	4.41	3.08
Des Moines, Iowa	1.21	.24	1.08	1.19	1.65	2.55	2.98	4.52	4.56	3.99	4.96	.69
Dubuque, Iowa	1.49	.42	1.38	.83	2.21	2.18	2.92	4.12	4.32	7.91	4.55	2.31
St. Louis, Mo	2.27	3.66	2.75	.56	3.43	7.67	3.52	6.30	4.24	9.21	4.47	2.59
Springfield, Mo	2.66	3.47	2.27	.79	4.07	7.46	3.86	9.65	5.55	5.85	5.19	5.95
Bismarck, N. Dak	.54	.24	.50	.19	1.04	.90	1.88	1.37	2.50	7.04	3.54	2.72
Devils Lake, N. Dak	.60	.55	.53	.53	1.01	.86	2.03	2.18	2.20	4.60	3.53	2.47
Pierre, S. Dak	.46	.30	.44	.11	1.33	.93	1.98	3.24	2.13	5.17	3.08	2.62
North Platte, Nebr	.47	.10	.40	.48	.87	1.26	2.15	3.36	3.06	1.40	3.25	4.51
Omaha, Nebr	.65	.11	.76	.91	1.39	1.68	3.01	2.03	4.50	1.36	5.05	1.27
Concordia, Kans	.72	.20	.75	1.41	1.48	2.24	2.42	3.80	4.70	1.51	4.97	5.82
Dodge City, Kans	.47	.02	.71	1.21	.88	1.73	1.87	4.37	3.34	.74	3.32	3.69
Iola, Kans	1.45	1.11	1.47	.41	2.88	5.50	3.99	8.44	5.28	4.14	5.46	6.72
Washington, D. C	3.37	1.20	3.42	3.34	3.85	1.27	3.25	4.96	3.83	2.21	4.18	4.01
Lynchburg, Va	3.72	1.09	3.49	3.14	3.81	1.29	3.17	3.99	3.99	1.42	3.89	1.87
Norfolk, Va	3.37	.61	3.75	3.24	4.28	2.18	3.79	4.87	4.07	3.57	4.33	4.68
Parkersburg, W. Va	3.19	4.01	3.24	3.33	3.82	3.10	2.91	4.47	3.46	2.76	4.65	2.52
Charlotte, N. C	4.29	1.05	4.39	3.84	4.57	3.83	3.44	3.04	3.92	1.44	4.46	3.41
Charleston, S. C	3.45	.63	3.41	2.17	3.72	2.97	2.99	.63	3.47	.71	5.39	4.10
Atlanta, Ga	5.31	1.11	4.65	6.20	5.78	3.31	3.63	1.84	3.09	1.24	3.88	3.02
Thomasville, Ga	4.13	.08	4.48	4.18	5.09	1.47	3.65	1.79	4.01	.43	4.72	5.62
Jacksonville, Fla	3.12	.40	3.43	3.54	3.52	1.67	2.72	.18	4.25	.09	5.53	7.56
Miami, Fla	2.73	1.60	2.13	2.52	2.61	.88	3.33	2.23	6.48	.68	7.13	2.40
Memphis, Tenn	5.21	3.51	4.35	2.89	5.77	13.04	4.83	13.13	4.34	5.40	4.37	4.16
Nashville, Tenn	4.85	3.27	4.32	4.26	5.44	9.66	4.36	7.38	3.50	3.63	4.37	4.49
Birmingham, Ala	5.32	1.21	4.75	5.41	5.76	6.14	3.67	2.25	3.09	3.53	3.88	5.45
Mobile, Ala	4.85	.79	5.36	7.93	7.17	6.27	4.35	1.80	4.00	1.49	5.95	5.72
New Orleans, La	4.63	.61	4.47	10.15	5.30	7.09	4.91	14.94	3.88	3.14	6.16	7.78
Shreveport, La	4.42	1.46	3.61	2.94	4.52	5.02	4.58	7.70	4.16	4.59	3.58	5.76
Amarillo, Tex	.60	.18	.88	.23	.65	.40	1.72	1.95	3.67	.07	2.99	1.51
Brownsville, Tex	1.39	1.46	1.40	.46	1.20	.17	1.25	.87	2.26	.28	2.64	6.51
El Paso, Tex	.51	.05	.46	.18	.38	.28	.23	T.	.35	.00	.55	.10
Fort Worth, Tex	1.51	1.45	1.52	1.77	2.18	2.19	4.12	3.66	4.36	.44	3.08	3.33
Galveston, Tex	3.62	1.17	3.10	1.74	2.90	.06	3.13	2.58	3.23	.12	4.75	3.09
San Antonio, Tex	1.68	.65	1.78	1.96	1.68	2.02	2.94	2.05	2.96	2.04	3.11	7.91
Oklahoma City, Okla	1.34	1.61	.98	1.07	2.38	2.23	2.80	4.59	5.75	1.94	3.07	4.95
Little Rock, Ark	4.79	4.50	4.18	3.03	4.94	6.89	4.51	14.81	5.10	6.82	4.09	5.71
Havre, Mont	.69	.56	.47	.55	.48	.49	1.01	1.24	2.09	7.09	2.82	1.05
Kalispell, Mont	1.59	1.31	1.46	1.04	1.08	.69	1.06	.41	2.03	1.54	1.74	1.72
Cheyenne, Wyo	.40	.15	.56	1.09	.95	1.93	1.85	2.25	2.43	2.01	1.57	2.02
Sheridan, Wyo	.89	.70	.69	.45	1.26	.98	1.91	4.32	2.74	3.98	1.95	2.90
Pueblo, Colo	.35	.23	.47	.90	.86	1.18	1.43	.07	1.68	.95	1.47	1.89
Santa Fe, N. Mex	.59	.18	.84	1.62	.73	.73	.86	.58	1.11	.16	1.04	3.28
Phoenix, Ariz	1.17	.01	.69	1.06	.49	.24	.43	.35	.03	.17	.12	.13
Modena, Utah	.73	.57	1.20	1.09	1.30	1.50	.79	.31	.87	.23	.40	.43
Salt Lake City, Utah	1.35	1.46	1.38	1.49	2.00	2.97	2.26	1.11	1.95	3.78	.77	.89
Winnemucca, Nev	1.04	.63	.93	2.49	.95	1.02	.88	.64	1.03	.90	.64	1.25
Boise, Idaho	1.80	2.27	1.42	2.01	1.44	1.28	1.18	.64	1.29	1.72	.88	.80
Seattle, Wash	4.74	4.95	3.67	4.68	2.72	2.69	2.42	1.58	1.84	1.81	1.38	.37
Walla Walla, Wash	2.01	1.58	1.58	1.57	1.89	1.84	1.70	.50	1.83	.94	1.19	2.22
Portland, Oreg	6.59	9.18	5.42	6.95	4.66	2.11	3.02	1.69	2.23	2.24	1.64	2.68
Roseburg, Oreg	5.70	6.01	4.56	7.26	3.98	2.12	2.48	1.80	2.05	1.80	1.07	.69
Eureka, Calif	7.63	5.83	7.03	10.30	6.97	3.95	3.93	3.32	2.54	1.68	1.06	.91
Fresno, Calif	1.60	2.19	1.33	2.49	1.76	1.28	.71	.56	.63	.18	.10	.12
Los Angeles, Calif	2.84	1.09	2.91	9.03	3.00	2.07	1.13	.70	.48	T.	.07	T.
Sacramento, Calif	3.69	2.30	3.14	4.99	3.01	1.01	2.00	1.47	.98	.21	.15	.57
San Diego, Calif	2.00	.82	1.96	6.68	1.70	2.05	.74	.71	.41	.12	.03	.12
San Francisco, Calif	4.33	3.77	3.70	6.85	3.14	2.19	1.82	1.95	.81	.10	.17	.38

T.=Trace, indicates an amount too small to measure.
[1] Normals are based on records of 20 or more year of observations.

TABLE 557.—*Precipitation: Normal and 1927, by months, at selected points in the United States*—Continued

Station	July		August		September		October		November		December		Annual	
	Normal	1927	Normal	1927	Normal	1927	Normal	1927	Normal	1927	Normal	1927	Normal	1927
	Ins.	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*	*Ins.*
Greenville, Me	4.93	3.77	3.55	5.57	3.83	2.39	3.28	9.11	2.99	6.20	3.29	4.77	40.88	47.34
Boston, Mass	3.36	4.77	4.03	6.73	3.19	2.43	3.86	3.77	4.10	4.71	3.41	5.22	43.38	42.06
Buffalo, N. Y	3.11	5.50	3.03	1.84	2.99	1.08	3.37	2.68	3.03	6.71	3.25	4.01	35.82	35.98
Canton, N. Y	3.23	3.94	2.69	3.11	2.81	1.68	3.34	3.43	3.41	9.25	3.59	4.17	36.18	37.39
Trenton, N. J	4.77	4.40	5.37	7.93	3.59	2.03	3.41	7.41	3.43	8.57	3.16	5.36	44.43	45.13
Pittsburgh, Pa	4.42	6.34	3.18	1.80	2.48	2.18	2.36	4.09	2.55	5.18	2.73	3.16	36.35	43.16
Scranton, Pa	3.83	4.48	4.25	4.77	2.86	1.45	2.91	9.16	2.29	4.26	2.61	3.75	37.05	45.44
Cincinnati, Ohio	3.54	3.09	3.33	3.54	2.31	3.28	2.32	3.07	3.21	6.46	2.93	3.48	38.33	46.87
Cleveland, Ohio	3.55	3.11	3.15	.70	3.22	2.74	2.73	1.85	2.75	7.19	2.58	3.91	35.01	34.28
Evansville, Ind	3.81	3.62	3.24	1.64	2.66	4.74	3.10	1.48	4.11	3.60	3.83	4.58	43.16	51.97
Indianapolis, Ind	4.13	3.48	3.33	2.64	3.05	2.70	2.79	2.01	3.52	4.69	3.04	2.99	41.48	42.36
Chicago, Ill	3.64	2.94	2.88	3.17	3.02	6.72	2.55	1.77	2.50	4.66	2.07	2.74	33.28	39.55
Peoria, Ill	2.97	4.94	2.93	1.45	3.12	5.82	2.57	4.20	2.64	3.82	2.37	2.91	36.29	52.10
Grand Rapids, Mich	2.63	1.43	2.59	.66	3.12	4.55	2.54	3.03	2.53	4.55	2.54	3.16	31.47	30.28
Marquette, Mich	3.10	6.15	2.86	.41	3.51	2.20	3.19	1.67	2.79	3.59	2.52	3.19	32.63	30.98
Madison, Wis	3.99	1.97	3.21	.46	3.18	6.22	2.42	4.23	1.80	2.42	1.77	1.58	31.71	33.19
Duluth, Minn	3.65	5.00	3.53	2.59	3.55	3.36	2.74	.91	1.58	2.01	1.22	1.97	29.93	29.97
St. Paul, Minn	3.40	2.11	3.46	1.95	3.42	4.27	2.34	2.25	1.30	1.47	1.06	2.62	28.68	26.43
Des Moines, Iowa	3.86	1.93	3.61	1.61	3.07	3.65	2.68	2.16	1.48	.44	1.31	1.10	32.45	24.07
Dubuque, Iowa	4.30	.84	3.04	1.47	3.59	10.70	2.68	4.55	1.81	1.01	1.72	1.58	34.01	37.92
St. Louis, Mo	3.43	2.79	2.66	2.60	2.91	2.93	2.41	4.65	2.88	5.56	2.23	2.31	37.20	50.83
Springfield, Mo	4.79	6.80	4.31	8.68	3.76	2.20	2.80	4.29	2.64	5.44	2.67	1.87	44.57	62.45
Bismarck, N. Dak	2.14	2.26	1.98	3.12	1.19	.47	1.03	.53	.68	.80	.62	1.20	17.64	20.84
Devils Lake, N. Dak	3.78	2.25	2.76	2.98	1.39	.13	1.23	2.27	.71	.63	.39	.06	20.16	19.51
Pierre, S. Dak	2.35	.97	2.01	2.88	1.11	.60	.81	1.19	.43	.87	.50	1.11	16.63	19.49
North Platte, Nebr	2.68	.43	2.46	3.41	1.50	3.15	1.15	.26	.40	.26	.47	.38	18.80	19.00
Omaha, Nebr	4.33	2.92	3.62	2.35	3.03	3.16	2.35	1.12	1.06	.06	.91	.49	30.66	17.66
Concordia, Kans	3.62	4.27	2.81	7.74	2.58	1.55	2.00	.87	.94	.26	.48	.36	27.47	30.03
Dodge City, Kans	3.38	4.19	2.59	5.98	1.77	2.77	1.40	.23	.55	.15	.56	.02	20.84	25.10
Iola, Kans	4.42	4.68	3.62	9.11	3.86	5.62	2.69	4.14	1.45	1.88	1.06	1.54	37.63	53.29
Washington, D. C	4.65	1.82	4.40	3.84	3.59	1.19	3.09	5.33	2.71	2.65	3.16	3.51	43.50	35.33
Lynchburg, Va	4.03	5.90	4.25	4.27	3.63	.31	3.38	6.51	2.79	1.91	3.27	3.88	43.42	35.58
Norfolk, Va	5.80	6.72	5.97	3.85	4.06	1.68	3.91	5.14	2.72	2.36	3.49	5.99	49.54	44.89
Parkersburg, W. Va	4.66	4.46	3.53	3.76	2.72	.67	2.44	1.99	2.83	5.59	2.77	3.61	40.22	40.29
Charlotte, N. C	5.49	5.52	5.55	3.02	3.22	1.11	3.15	4.15	2.86	1.30	3.86	9.52	49.20	41.23
Charleston, S. C	7.26	4.61	6.97	8.79	5.46	1.23	3.93	2.37	2.87	.46	3.15	1.19	52.07	29.86
Atlanta, Ga	4.73	4.37	4.48	1.66	3.53	.69	2.34	1.25	3.40	1.55	4.54	8.01	49.36	34.25
Thomasville, Ga	5.32	6.11	5.03	3.40	4.25	2.54	3.46	1.24	2.64	.98	3.69	5.88	50.47	33.72
Jacksonville, Fla	6.20	6.85	6.21	1.98	8.03	2.39	5.06	2.20	2.19	.83	2.09	1.98	53.25	29.67
Miami, Fla	6.17	5.00	6.42	4.40	8.72	8.83	8.96	3.73	2.84	.90	2.00	.52	59.52	33.69
Memphis, Tenn	3.51	1.58	3.20	2.95	3.05	1.45	2.74	2.28	4.59	6.11	4.38	2.64	50.34	59.14
Nashville, Tenn	4.35	1.59	3.47	1.86	3.68	1.65	2.48	3.75	3.85	4.48	3.82	2.69	48.49	48.71
Birmingham, Ala	4.70	4.18	4.48	3.51	3.50	.03	2.34	1.87	3.39	4.84	4.60	9.43	49.48	47.85
Mobile, Ala	7.04	3.49	6.81	4.36	5.02	2.35	3.18	2.82	3.74	3.64	4.57	4.97	62.01	45.63
New Orleans, La	6.47	6.06	5.61	8.52	4.81	5.48	2.93	2.23	3.79	2.25	4.46	4.24	57.42	73.39
Shreveport, La	3.72	6.07	2.24	.81	3.22	2.80	3.18	2.66	4.08	.59	4.37	3.62	45.68	44.62
Amarillo, Tex	3.17	1.68	2.81	5.31	2.36	3.40	1.71	.14	1.16	.02	.83	.47	20.55	15.42
Brownsville, Tex	1.89	1.19	2.43	.41	5.45	4.82	3.23	2.56	2.07	1.32	1.51	2.61	26.72	22.66
El Paso, Tex	2.13	2.52	1.72	1.34	1.45	1.04	.95	.02	.59	T.	.52	.72	9.84	6.25
Fort Worth, Tex	2.57	1.53	2.72	.80	2.46	4.00	2.69	4.47	2.57	.58	1.84	2.59	31.62	23.81
Galveston, Tex	3.98	3.61	5.01	.02	5.41	2.00	4.18	.50	4.02	1.43	3.73	6.18	47.06	23.40
San Antonio, Tex	2.22	.49	2.69	.15	2.94	1.52	1.49	1.44	1.78	.03	1.56	2.49	26.83	22.75
Oklahoma City, Okla	3.65	3.31	3.17	4.65	2.75	3.63	1.81	7.81	2.25	.63	1.74	1.23	31.69	37.65
Little Rock, Ark	3.99	1.09	3.65	8.81	3.26	1.37	2.55	1.37	4.59	8.18	4.24	3.82	49.89	6.40
Havre, Mont	1.92	3.81	1.26	.39	1.03	.55	.50	1.03	.77	1.34	.63	.91	13.67	10.01
Kalispell, Mont	.84	.77	.89	.92	1.33	2.76	1.17	3.17	1.90	2.59	1.85	1.69	16.94	18.01
Cheyenne, Wyo	1.99	2.66	1.47	4.04	.94	1.03	.72	1.77	.41	.64	.31	.47	13.60	20.06
Sheridan, Wyo	1.20	.92	.72	2.52	1.52	1.81	1.23	.11	.07	2.33	.68	.76	15.46	21.78
Pueblo, Colo	1.97	1.86	1.57	2.50	.62	1.16	.70	.01	.37	.27	.46	.70	11.95	11.72
Santa Fe, N. Mex	2.71	1.00	2.36	3.41	1.61	2.23	1.07	.29	.78	.19	.76	.44	14.49	14.17
Phoenix, Ariz	1.07	.24	.96	.69	1.01	.83	.35	.57	.98	.14	.59	1.30	7.87	5.73
Modena, Utah	1.26	1.17	1.83	3.41	1.12	1.40	.82	1.64	.60	.69	.58	.91	11.50	13.35
Salt Lake City, Utah	.54	.22	.78	.87	.85	2.08	1.40	1.19	1.42	2.69	1.33	1.94	16.03	20.60
Winnemucca, Nev	.17	.21	.17	.24	.34	.21	.52	.91	.74	1.37	.99	1.10	8.40	10.07
Boise, Idaho	.18	T.	.16	.35	.41	1.39	1.28	1.09	.86	3.25	1.72	.61	12.71	15.41
Seattle, Wash	.62	.10	.62	1.03	1.69	2.73	2.69	3.85	5.33	5.86	5.39	3.33	33.11	32.98
Walla Walla, Wash	.39	.01	.45	.57	.93	4.50	1.47	1.01	2.13	3.19	2.10	.58	17.67	18.51
Portland, Oreg	.62	.95	.63	.35	1.84	5.52	3.28	2.65	6.41	7.99	6.90	3.47	43.24	46.78
Roseburg, Oreg	.32	T.	.33	.03	1.04	1.72	2.61	1.37	4.37	5.31	5.92	3.89	34.43	32.02
Eureka, Calif	.11	.00	.10	.02	1.11	.86	2.65	1.17	5.67	5.89	7.25	3.10	46.05	37.03
Fresno, Calif	.00	.00	.00	T.	.27	.09	.72	2.35	1.03	1.05	1.53	.76	9.63	11.07
Los Angeles, Calif	.00	T.	.00	T.	.06	T.	.77	2.04	1.48	.61	2.90	3.09	15.64	18.63
Sacramento, Calif	.00	.00	.01	T.	.39	.01	1.04	1.45	2.15	1.81	3.53	1.55	20.09	15.37
San Diego, Calif	.00	.00	.00	.01	.06	.04	.46	1.76	.83	.05	1.82	4.57	10.01	16.43
San Francisco, Calif	.01	T.	.00	T.	.29	T.	1.29	1.93	2.47	3.18	4.24	3.94	22.27	24.29

Weather Bureau.
T. = Trace, indicates an amount too small to measure.

TABLE 558.—*Frost: Dates of killing frosts, with length of growing season*

Station	Date of last killing frost in spring, 1927	Date of first killing frost in fall, 1927	Averages and extremes for 30 to 50 years				
			Spring frosts		Fall frosts		Length of growing season between average dates of killing frosts
			Latest date of killing frost	Average date of last killing frost	Earliest date of killing frost	Average date of first killing frost	
							Days
Greenville, Me	June 3[1]	Sept. 28	June 23	May 30	Aug. 26	Sept. 14	107
Portland, Me	Apr. 25	Oct. 11	June 20	May 14	Sept. 11	Oct. 18	157
Concord, N. H	do	do	June 5	May 7	Sept. 6	Sept. 30	146
Northfield, Vt	May 18	do	June 20	May 22	Aug. 27	Sept. 19	120
Boston, Mass	Apr. 9[1]	Nov. 8	May 16	Apr. 14	Sept. 26	Oct. 24	193
Hartford, Conn	Apr. 5	Oct. 31	May 22	Apr. 23	Sept. 16	Oct. 13	173
Albany, N. Y	Apr. 15[1]	do	May 30	do	Sept. 15	Oct. 16	176
Buffalo, N. Y	Apr. 24	Nov. 6	May 21	Apr. 28	Oct. 3	Oct. 21	176
Canton, N. Y	Apr. 30	Oct. 9	June 2	May 8	Sept. 11	Sept. 28	143
Setauket, N. Y	Mar. 30[1]	Nov. 8	May 17	Apr. 16	Oct. 22	Nov. 10	208
Syracuse, N. Y	Apr. 24	Oct. 30	May 5	Apr. 24	Oct. 1	Oct. 22	181
Atlantic City, N. J	Apr. 11	Nov. 8	Apr. 30	Apr. 11	do	Nov. 5	208
Trenton, N. J	do	Nov. 7	May 17	Apr. 20	Sept. 22	Oct. 19	182
Erie, Pa	Apr. 23	Nov. 13	do	do	Oct. 9	Nov. 2	196
Harrisburg, Pa	Mar. 28[1]	Nov. 6	May 12	Apr. 10	Oct. 3	Oct. 27	200
Pittsburgh, Pa	Apr. 28	do	May 29	Apr. 21	Sept. 25	Oct. 22	184
Scranton, Pa	Apr. 26	Oct. 24	May 10	Apr. 20	Sept. 14	Oct. 13	176
Cincinnati, Ohio	Apr. 24	Nov. 6	Apr. 26	Apr. 14	Sept. 30	Oct. 25	194
Cleveland, Ohio	do	Nov. 13[1]	May 21	Apr. 15	Oct. 2	Nov. 2	201
Columbus, Ohio	do	Nov. 6	May 17	Apr. 17	Sept. 21	Oct. 18	184
Dayton, Ohio	do	do	May 11	Apr. 15	Oct. 9	Oct. 27	195
Toledo, Ohio	do	do	May 29	Apr. 22	Sept. 9	Oct. 18	179
Evansville, Ind	Mar. 4[1]	do	Apr. 26	Apr. 6	Sept. 30	Oct. 27	204
Fort Wayne, Ind	Apr. 24	Oct. 18	May 28	Apr. 25	Sept. 14	Oct. 13	171
Indianapolis, Ind	do	Nov. 4	May 25	Apr. 16	Sept. 21	Oct. 19	186
Cairo, Ill	Mar. 4	Nov. 3	Apr. 30	Mar. 31	Sept. 30	Oct. 29	212
Chicago, Ill	Apr. 23	Nov. 4	May 23	Apr. 18	Sept. 20	Oct. 18	183
Peoria, Ill	Apr. 21	Nov. 6	May 11	Apr. 15	Sept. 30	Oct. 19	187
Springfield, Ill	Apr. 23	Oct. 14	May 25	do	Sept. 25	do	187
Alpena, Mich	Apr. 30[1]	Oct. 10	June 9	May 13	Sept. 6	Sept. 30	140
Detroit, Mich	Apr. 24	Nov. 6	May 31	Apr. 30	Sept. 21	Oct. 14	167
Grand Haven, Mich	Apr. 23	Oct. 18	May 28	May 1	Sept. 23	Oct. 17	169
Grand Rapids, Mich	Apr. 25	do	do	Apr. 28	do	do	172
Ludington, Mich	Apr. 30[1]	Nov. 7[1]	June 17	May 2	Sept. 4	Oct. 21	172
Marquette, Mich	do	Nov. 4	June 6	May 13	Aug. 23	Oct. 9	149
Green Bay, Wis	do	do	May 30	May 5	Sept. 16	do	157
La Crosse, Wis	Apr. 23	Oct. 14	May 24	Apr. 28	Sept. 10	Oct. 10	165
Madison, Wis	do	Nov. 2	May 25	Apr. 25	Sept. 16	Oct. 17	175
Milwaukee, Wis	do	Nov. 5	May 29	Apr. 28	Sept. 25	Oct. 16	171
Duluth, Minn	Apr. 30[1]	Sept. 26	June 11	May 7	Sept. 10	Oct. 4	150
Minneapolis, Minn	Apr. 23[1]	Oct. 9	May 20	Apr. 26	Sept. 13	Oct. 10	167
Moorhead, Minn	May 14	Sept. 23	June 8	May 13	Aug. 25	Sept. 24	134
Charles City, Iowa	Apr. 23	Oct. 14	May 21	Apr. 30	Sept. 12	Oct. 7	160
Des Moines, Iowa	Apr. 24	do	May 31	Apr. 21	Sept. 13	Oct. 10	172
Dubuque, Iowa	Apr. 23	do	May 21	Apr. 20	Sept. 21	Oct. 15	178
Keokuk, Iowa	do	do	May 4	Apr. 14	Sept. 18	Oct. 13	182
Columbia, Mo	Apr. 22	Nov. 6	May 9	Apr. 12	do	Oct. 14	185
St. Joseph, Mo	Mar. 22[1]	do	Apr. 28	Apr. 11	Sept. 26	do	186
St. Louis, Mo	Mar. 3	do	May 22	Apr. 4	Sept. 30	Oct. 28	207
Springfield, Mo	Apr. 22	do	May 19	Apr. 14	do	Oct. 21	190
Bismarck, N. Dak	May 11[1]	Sept. 21	June 7	May 11	Aug. 23	Sept. 20	132
Devils Lake, N. Dak	do	Sept. 19	do	May 16	Aug. 8	Sept. 19	126
Williston, N. Dak	May 10	Sept. 20	June 16	May 15	Aug. 22	Sept. 20	128
Huron, S. Dak	Apr. 22	Oct. 9	June 21	May 10	Aug. 23	Sept. 23	136
Pierre, S. Dak	May 5	Sept. 27	May 19	Apr. 30	Sept. 12	Oct. 5	158
Rapid City, S. Dak	May 11	Sept. 20	May 21	May 4	Sept. 13	Sept. 29	148
Yankton, S. Dak	Apr. 21[1]	Oct. 31	May 27	May 1	Sept. 14	Oct. 6	158
North Platte, Nebr	Apr. 22	Oct. 8	May 24	do	Sept. 10	Sept. 30	152
Omaha, Nebr	do	Nov. 6	May 19	Apr. 15	Sept. 18	Oct. 13	184
Valentine, Nebr	May 11[1]	Sept. 20	June 21	May 6	Sept. 12	Oct. 1	138
Concordia, Kans	Apr. 22	Nov. 2	May 19	Apr. 17	Sept. 20	Oct. 17	183
Dodge City, Kans	Apr. 21	Nov. 6	May 27	Apr. 21	Sept. 23	Oct. 21	183
Iola, Kans	Mar. 20[1]	do	May 4	Apr. 7	Sept. 26	Oct. 23	199
Wichita, Kans	Apr. 22	do	May 15	Apr. 10	Sept. 23	Oct. 25	198
Washington, D. C	Mar. 25	Nov. 7	May 12	Apr. 8	Oct. 2	Oct. 20	195
Lynchburg, Va	Mar. 5	Nov. 6[1]	May 7	Apr. 28	do	Oct. 27	182
Norfolk, Va	do	Nov. 7	Apr. 26	Mar. 25	Oct. 11	Nov. 17	237
Richmond, Va	Mar. 25[1]	do	do	Apr. 7	Oct. 12	Oct. 31	207
Wytheville, Va	Apr. 25	Oct. 15	May 15	Apr. 15	Sept. 19	Oct. 13	181
Elkins, W. Va	Apr. 28	Oct. 26	May 26	May 8	Sept. 20	Oct. 8	153
Parkersburg, W. Va	Apr. 25	Nov. 6	May 22	Apr. 16	Oct. 1	Oct. 16	163
Asheville, N. C	do	do.[1]	May 10	Apr. 15	Oct. 3	Oct. 20	188
Charlotte, N. C	Mar. 25	Nov. 7	Apr. 26	Mar. 28	Oct. 8	Nov. 5	[illegible]
Raleigh, N. C	Mar. 5	do	do	Mar. 29	do	do	221
Wilmington, N. C	do	do	May 1	Mar. 23	Oct. 16	Nov. 13	[illegible]
Charleston, S. C	Mar. 4	Dec. 10	Apr. 2	Feb. 20	Nov. 8	Dec. 10	[illegible]

[1] Temperature 32° F. or below.

TABLE 558.—*Frost: Dates of killing frosts, with length of growing season*—Contd.

Station	Date of last killing frost in spring, 1927	Date of first killing frost in fall, 1927	Averages and extremes for 30 to 50 years: Spring frosts: Latest date of killing frost	Spring frosts: Average date of last killing frost	Fall frosts: Earliest date of killing frost	Fall frosts: Average date of first killing frost	Length of growing season between average dates of killing frosts
							Days
Columbia, S. C	Mar. 5[1]	Nov. 21	Apr. 17	Mar. 18	Oct. 30	Nov. 18	245
Greenville, S. C	Mar. 25	Nov. 19	Apr. 24	Apr. 3	Oct. 10	Nov. 2	213
Atlanta, Ga	Mar. 4	do	Apr. 17	Mar. 31	Oct. 11	Nov. 7	221
Augusta, Ga	Mar. 5	Nov. 21	do	Mar. 22	Oct. 21	Nov. 10	233
Macon, Ga	do	Nov. 19	Apr. 18	Mar. 23	Oct. 11	Nov. 7	229
Savannah, Ga	Mar. 3	Dec. 17	Apr. 13	Feb. 26	Oct. 25	Nov. 24	271
Thomasville, Ga	Mar. 4	Dec. 9	Apr. 26	Mar. 14	Oct. 21	Nov. 15	246
Apalachicola, Fla	Jan. 17	do	Mar. 23	Feb. 14	Nov. 13	Dec. 7	296
Avon Park, Fla	Jan. 16		Feb. 25	Jan. 12	Nov. 14	Dec. 26	348
Jacksonville, Fla	Mar. 3	Dec. 20	Apr. 10	Feb. 16	Nov. 12	Dec. 6	293
Miami, Fla	None.	None.	Feb. 19	(2)	Dec. 26	(2)	(2)
Tampa, Fla	Jan. 16[1]	do	Apr. 7	Jan. 26	Nov. 21	Jan. 3[3]	342
Chattanooga, Tenn	Mar. 5	Nov. 19	May 14	Apr. 2	Sept. 30	Oct. 26	207
Knoxville, Tenn	Apr. 23	do	Apr. 26	do	Oct. 1	Oct. 28	209
Memphis, Tenn	Mar. 4	Nov. 18	Apr. 25	Mar. 22	Oct. 2	Nov. 3	226
Nashville, Tenn	Mar. 5	Nov. 6	Apr. 24	Apr. 2	Oct. 8	Oct. 27	208
Birmingham, Ala	Mar. 4	Nov. 19	Apr. 17	Mar. 16	Oct. 21	Nov. 9	238
Mobile, Ala	Mar. 3	Dec. 9	Apr. 6	Feb. 17	Oct. 31	Dec. 5	291
Montgomery, Ala	Mar. 4	Nov. 19	Apr. 5	Mar. 10	Oct. 21	Nov. 11	246
New Orleans, La	Jan. 16	Dec. 9	Mar. 27	Jan. 25	Nov. 11	Dec. 16	325
Shreveport, La	Mar. 3	Nov. 17	Apr. 9	Mar. 6	Oct. 20	Nov. 10	249
Abilene, Tex	Apr. 22	Nov. 16	Apr. 23	Mar. 21	Oct. 19	do	234
Amarillo, Tex	do	Nov. 6	May 23	Apr. 17	Sept. 22	Oct. 29	195
Brownsville, Tex	None.	None.	Mar. 8	Jan. 28	Nov. 15	Dec. 22	328
Corpus Christi, Tex	Jan. 15[1]	do	Mar. 19	Jan. 21	Nov. 29	Dec. 28	341
Del Rio, Tex	Jan. 16[1]	Dec. 8	Mar. 27	Feb. 28	Oct. 27	Nov. 17	262
El Paso, Tex	Mar. 22	Nov. 17	Apr. 26	Mar. 14	do	Nov. 15	246
Fort Worth, Tex	do	Dec. 1	Apr. 9	Mar. 11	Oct. 22	Nov. 12	246
Galveston, Tex	None.	None.	Mar. 1	Jan. 19	Nov. 16	Dec. 26	341
Palestine, Tex	Mar. 2[1]	Dec. 8	Apr. 5	Mar. 13	Oct. 20	Nov. 13	245
San Antonio, Tex	do	do[1]	do	Feb. 24	Oct. 30	Nov. 28	277
Taylor, Tex	do	Dec. 3	do	Mar. 13	do	Nov. 22	254
Oklahoma City, Okla	Mar. 21	Nov. 12	Apr. 30	Mar. 31	Oct. 7	Nov. 2	216
Fort Smith, Ark	Mar. 22	Nov. 16	Apr. 17	Mar. 21	Oct. 9	Nov. 6	230
Little Rock, Ark	do	Nov. 17	Apr. 26	Mar. 18	Oct. 22	Nov. 14	241
Havre, Mont	May 3	Sept. 20	June 6	May 16	Aug. 25	Sept. 19	126
Helena, Mont	May 10	Oct. 30	June 9	May 9	do	Sept. 28	142
Kalispell, Mont	May 9	Oct. 11	June 7	May 5	Sept. 10	Oct. 2	150
Miles City, Mont	May 10	Sept. 20	May 31	do	Sept. 7	do	150
Cheyenne, Wyo	do	Sept. 26	June 13	May 20	Aug. 25	Sept. 19	122
Lander, Wyo	do	Sept. 27	June 18	May 19	Aug. 23	Sept. 18	122
Sheridan, Wyo	May 30	Sept. 19	June 6	May 20	Aug. 25	Sept. 20	123
Yellowstone Park, Wyo	June 2	Oct. 5	June 22	May 21	do	Sept. 16	118
Denver, Colo	Apr. 21[1]	Oct. 12	June 6	May 4	Sept. 12	Oct. 8	157
Grand Junction, Colo	Apr. 15	Nov. 5	May 14	Apr. 19	Sept. 14	Oct. 19	183
Pueblo, Colo	Apr. 21	Nov. 2	June 2	Apr. 27	Sept. 12	Oct. 8	164
Roswell, N. Mex	Apr. 22	Nov. 12	May 7	Apr. 12	Oct. 10	Oct. 27	198
Santa Fe, N. Mex	Apr. 15	Oct. 12	May 18	Apr. 25	Sept. 25	Oct. 18	176
Flagstaff, Ariz	June 1[1]	Sept. 27	June 17	May 31	Sept. 12	Sept. 24	116
Phoenix, Ariz	Jan. 1[1]	Dec. 8	Mar. 31	Feb. 16	Nov. 5	Dec. 3	290
Tucson, Ariz	Mar. 22		Apr. 3	Mar. 11	Oct. 22	Nov. 9	243
Yuma, Ariz	None.	Dec. 9[4]	Feb. 18	Jan. 2	Nov. 30	Dec. 25	357
Modena, Utah	May 22	Oct. 7	July 3	May 23	Sept. 5	Sept. 26	126
Salt Lake City, Utah	Apr. 21	do	June 18	Apr. 20	Sept. 22	Oct. 20	183
Reno, Nev	May 29[1]	Oct. 6	June 13	May 13	Sept. 6	Oct. 3	143
Winnemucca, Nev	do[1]	Sept. 14	June 22	May 16	Aug. 22	Sept. 26	133
Boise, Idaho	Apr. 20	Oct. 6	June 16	Apr. 27	Sept. 11	Oct. 12	168
Lewiston, Idaho	Apr. 21	Oct. 31	May 10	Apr. 5	Sept. 21	Oct. 25	203
Pocatello, Idaho	do	Oct. 6	June 1	May 1	Sept. 12	Oct. 6	158
Seattle, Wash	Apr. 20	Dec. 6	May 10	Mar. 17	Oct. 18	Nov. 21	249
Spokane, Wash	Apr. 21	Oct. 31	June 8	Apr. 14	Sept. 7	Oct. 13	182
Walla Walla, Wash	do	Nov. 22	Apr. 28	Mar. 30	Sept. 28	Nov. 5	220
Baker, Oreg	May 2	Oct. 6	June 23	May 8	Aug. 30	Sept. 30	145
Portland, Oreg	Feb. 12[1]	Dec. 7	May 2	Mar. 18	Oct. 13	Nov. 19	246
Roseburg, Oreg	Apr. 20	Nov. 1	May 24	Apr. 14	Sept. 24	Nov. 12	212
Eureka, Calif	Jan. 22	Dec. 11	Apr. 7	Feb. 8	Nov. 11	Nov. 26	291
Fresno, Calif	Jan. 1	Dec. 7	Apr. 14	Feb. 22	Oct. 31	Dec. 2	283
Independence, Calif	May 22[1]	Oct. 9	May 24	Apr. 6	Sept. 24	Oct. 28	205
Los Angeles, Calif	None.	None.	Feb. 17	(2)	Nov. 2	(2)	(2)
Red Bluff, Calif	Feb. 12	Dec. 8	May 9	Mar. 10	Nov. 8	Dec. 6	271
Sacramento, Calif	Jan. 23	Dec. 7	May 7	Feb. 19	Nov. 11	Nov. 29	283
San Bernardino, Calif	Jan. 25[1]	Dec. 8	Apr. 18	Mar. 8	Oct. 23	Nov. 22	250
San Diego, Calif	None.	None.	Jan. 20	(2)	Dec. 26	(2)	(2)
San Francisco, Calif	do	do	Mar. 27	Jan. 25	Dec. 4	Dec. 10	319

Weather Bureau.

[1] Temperature 32° F. or below.
[2] Frosts do not occur every year.
[3] Of year following.
[4] Low places.

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